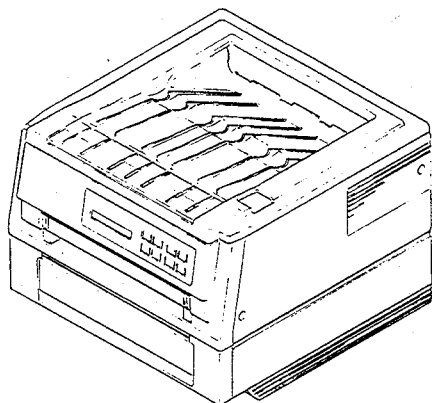


SHARP SERVICE MANUAL



CODE : 00ZJX9500SM/E

LASER PRINTER

MODEL JX-9500

CONTENTS

GENERAL
PRINT ENGINE
INTERFACE CONTROL UNIT (ICU)

CAUTION

This laser printer is a class 1 laser product complied with 21CFR 1040.10 and 1040.11 of the CDRH standard and IEC825. This means that this machine does not produce a hazardous laser radiation. The use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

This laser radiation is not a danger to the skin, but when an exact focusing of the laser beam is achieved on the eye's retina, there is danger of spot damage to the retina.

The following cautions must be observed to avoid exposure of the laser beam to your eyes at the time of servicing.

- 1) When a problem in the laser optical unit has occurred, the whole optical unit must be exchanged as a unit, not an individual part.
- 2) Do not look into the machine with the main switch turned on after removing the developer unit, toner cartridge, and drum cartridge.
- 3) Do not look into the laser beam exposure slit of the laser optical unit with the connector connected when removing and installing the optical system.
- 4) The upper frame contains the safety interlock switch.

Do not defeat the safety interlock by inserting wedges or other items into the switch slot.

The required Labels and hazard warnings from IEC standard 825.

(220V, 240V machine only)

**CLASS 1
LASER PRODUCT**

LASER KLASSE 1

CAUTION

INVISIBLE LASER RADIATION,
WHEN INTERLOCKS DEFEATED AND
TONER-DEVELOPER CARTRIDGE REMOVED.

VORSICHT

UNSICHTBARE LASERSTRAHLUNG,
WENN INTERLOCK ÜBERBRÜCKT IST UND
TONER-SOWIE ENTWICKLUNGSEINHEIT
ENTFERNT SIND.

ADVARSEL

USYNLIG LASERSTRÅLING VED ÅBNING NÅR
SIKKERHEDSAFBRYDERE ER UDE AF
FUNKTION. UNDGA UDSÆTTELSE FOR
STRÅLING.

VAROITUS !

Laite sisältää laserdiodin, joka lähettää
näkyvätöntä silmille vaarallista lasersäteilyä.

SHARP CORPORATION

This document has been published to be used
for after sales service only.
The contents are subject to change without notice.

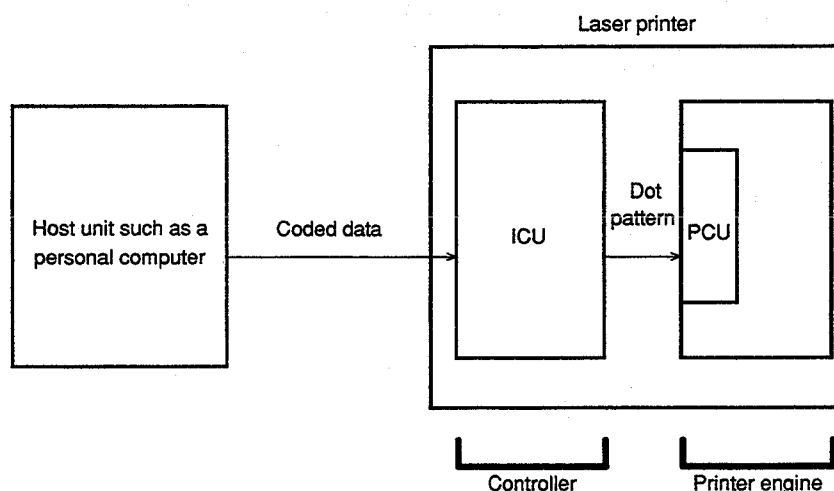
To begin with

The laser printer is used in connection with the host as a personal computer from which the print data is supplied.

The laser printer consists of two major blocks of the controller and the print engine.

The controller consists of the ICU (Interface Control Unit) which is employed to interpret the source print data to create dot pattern information based on the font.

The print engine is the block employed to print the data of the dot pattern information. The print engine includes the laser print mechanism, drum mechanism, and paper feed mechanism which are controlled by PCU (Process Control Unit). Dot pattern information is sent to the laser print block that is controlled by the PCU where the data is converted into laser beams.



This Service Manual describes the printer engine, the PCU (Process Control Unit) which controls the printer engine, and the ICU (Interface Control Unit) which analyzes code data from the host to form dot patterns in this sequence.

Contents of printer engine and ICU section

[1] BASIC SPECIFICATIONS	1
[2] OPERATOR PANEL DESCRIPTION	1
[3] UNPACKING AND INSTALLATION	5
[4] SUPPLIES	10
[5] OUTLOOK AND INTERNAL STRUCTURE	11
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[11] TROUBLESHOOTING	48
[12] PCU SECTION	58
[13] ICU section	80
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[1] BASIC SPECIFICATIONS

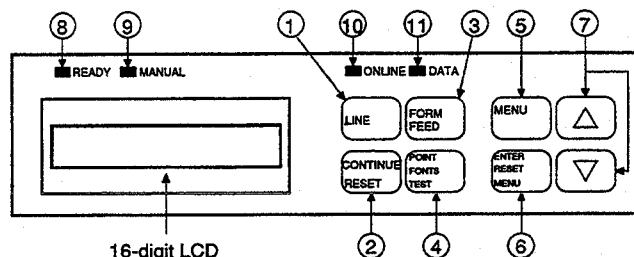
Type:	Desktop
Print process:	Diode laser, dry electrophotographic method
Resolution:	300 dpi
Paper feed system:	250-sheet (20 lbs.) cassette and manual feeds, cassette stored under the machine.
Paper size:	AB series: A4, B5 Inch series: Letter, executive, invoice, legal
Print speed:	6 sheets/minute (3000 character/page, simple text, Letter size)
Warm up time:	60 seconds, maximum, at the rated voltage, room temperature of 20°C, and 65% RH.
First print:	20 seconds maximum (after inactivity) for first print at 25°C
Multipage printing:	Host controlled or control panel controlled.
Paper delivery:	Facedown tray: 250 sheets (20 lbs.) Faceup tray: 30 sheets (20 lbs.)
Developing system:	Dry, two-component, magnetic brush type
Cleaning method:	By means of the cleaning blade in the drum cartridge
Fusing method:	Heat roller type Upper fuser roller (teflon coated) Lower fuser roller (silicon rubber)
Interface:	Centronics parallel interface RS232C serial interface
Power requirements:	120/220/240VAC, 50/60Hz, detachable AC cord
Power consumption:	650W during warm up
Operational noise:	50dBA, maximum during operation, except for impact noise 45dBA, maximum, during standby
Physical dimensions:	13-25/64"W x 14-3/16"D x 10-33/64"H 340(W) x 360(D) x 267(H) (mm)
Weight:	15kg (33.1 lbs.) approximately
Accessories:	Drum cartridge x1 Developer cartridge (developer included) x1 Toner cartridge (toner included) x1 Waste toner box x1 Letter or A4 size cassette x1 Cleaning oil pad Corona wire cleaner x1 AC cord x1
Supplies:	Drum cartridge Developer cartridge Toner kit (Toner cartridge, waste toner box and cleaning oil pad)
Options:	Expansion memory Font card Legal cassette A4, B5, Letter, Executive, Invoice cassette Second cassette unit Envelope feeder
Emulation:	HP LaserJet series II Epson FX-80 IBM Proprinter IBM Graphics Printer Diablo 630/630 ECS

[2] OPERATOR PANEL DESCRIPTION

The operation panel is used to set the Laser Printer off-line for direct operations, such as setting the menu items and executing self-tests. Note the following when using the operation panel:

- Set the printer off-line before using the keys.
- Some keys have several functions, which are selected by the duration of time the key is pressed. Be sure to check the functions on the display.

PANEL VIEW



1. Key functions

① LINE key

Used to alternately set the printer on-line and off-line. Also used to set the printer on-line after performing the self tests or setting the menu items. The Laser Printer can receive data from the computer when on-line (ON LINE lamp on) and cannot receive data from the computer when off-line (ON LINE lamp off).

② CONTINUE/RESET key

Used to select the following two functions:

CONTINUE: Clears most errors (See [11]-(B) Troubleshooting for error code)

Used for the following operations:

- To set the printer on-line from the off-line state after an error.
- To cancel printer self-test and set the printer on-line.
- To set the printer on-line from the menu setting mode.
- To continue printing with the current paper source even when the printer requests a different paper size (or envelope type).

RESET: Resets the Laser Printer to ensure that the panel default settings (the menu settings selected by the user) are available.

Includes the following operation:

- In HP LaserJet series II emulation, temporary soft fonts and temporary macros are cleared.
- Stored page data is cleared.

③ FORM FEED key

Prints data in the print buffer when the printer is off-line. This key is not functional when the printer is on-line.

④ PRINT FONTS/TEST key

Used to select the following three functions:

PRINT FONTS: Prints out available fonts.

SELF TEST #1: Prints the settings of the various menu items.

SELF TEST #2: Starts test pattern printing.

⑤ MENU key

Used to select the following two functions:

PRINTING MENU: Enters the Printing Menu mode. (See [13]-11. MENU SETTING STRUCTURE)

CONFIGURATION MENU: Enter the Configuration Menu mode. (See [13]-11. MENU SETTING STRUCTURE)

⑥ : ENTER/RESET MENU key

Used to select the following two functions:

ENTER: Specifies the menu values to be saved as panel default settings.

RESET MENU: Initializes all items in the Printing Menu to the factory default settings.

Also resets the following:

- In HP LaserJet series II emulation, temporary soft fonts and temporary macros are cleared.
- Stored page data is cleared.

⑦ : Δ and ∇ keys

Used to select values for the menu items. Each time the keys are pressed the menu values change.

2. LED activation and blink conditions

⑧ READY lamp (green)

Remains lit when the Laser Printer is on and ready to print. Blinks while receiving data on-line, is off during warm-up, and turns off when an error occurs.

⑨ MANUAL lamp (orange)

Lights when the manual feed mode is selected.

⑩ ON LINE lamp (green)

Lights when the Laser Printer is set on-line and ready to receive data from the computer. If the LINE key is pressed during printing to set the Laser Printer off-line, this lamp blinks until the page being printed is fed out, indicating that the Laser Printer cannot be set to off-line.

⑪ DATA lamp (orange)

Lights when the print buffer contains data to print. Blinks if the Laser Printer has waited more than 5 seconds for a form feed command and a partial page remains in the printer buffer.

3. 16-digit LCD display

The 16-character liquid crystal display indicates the following:

- Status messages
- Menu settings
- Error conditions
- Service messages

(See 4. Display specification)

4. Display specification

Explanations will be given about the meaning of the displayed message.

(1) STATUS

No.	DISPLAY MESSAGE	MEANING	TIMING/ CONDITION
1	WARMING UP	Printer in warmup	Printer in warmup
2	READY [LJ2] **	Indicates the ready condition, emulation, and feed source. Those parenthesized indicates the emulation. [HEX] indicates the hexadecimal dump mode. ** = T1, T2, MF, EV T1 = TRAY 1 T2 = TRAY 2 MF = MANUAL FEED EV = ENVELOPE	In the online mode.
3	READY [FX] **		
4	READY [PP] **		
5	READY [GP] **		
6	READY [D6] **		
7	READY [HEX] **		
8	TRAY 1 = **	Indicates the paper size and envelope kind of the selected feed source. ** = LETTER, LEGAL, EXECUT, INVOICE, A4, B5. *** = COM-10 MONARC, DL, C5	In the offline mode, except for an error occurrence.
9	TRAY 2 = **		
10	MANUAL FEED		
11	ENVELOPE = ***		
12	FONT PRINTOUT	Current font printout. Test pattern printout.	Test print in execution.
13	SELF TEST #1		
14	SELF TEST #2		
15	RESET	Printer reset	If the CONTINUE key is held down for more than 3 seconds.
16	MENU RESET	Function menu reset	If the ENTER key is held down for more than 3 seconds.
17	CHG. TRAY 1 = ***	Prompts to the kind of cassette to be exchanged.	Displays immediately before the start of printing of the page changed.
18	CHG. TRAY 2 = ***		
19	FEED = ****	Prompts the kind of manual feed paper, envelope kind.	

(2) ERROR STATUS (For details, refer to "[11]-(B) Troubleshooting for error code".)

No.	DISPLAY MESSAGE	MEANING	CONDITION
1	DATA MEMORY FULL	Too much data has been stored in the data memory	
2	DATA LOSS ERROR	Too many characters on one line	
3	INTERFACE ERROR	RS232C interface error	
4	INPUT BUFFER FULL	The host computer ignores the printer's busy state and continues to send data.	
5	FC MISMATCH	Font card hardware error or mismatch of font card emulation and printer setting.	
6	REPL. TONER COLL	Toner collecting container is not installed properly. Toner collecting container was not replaced when replacing the toner kit.	
7	REPL. DEVELOPER	End of developer cartridge life	
8	REPL. PHOTO. DRUM	End of photoconductor cartridge life	
9	REPL. TONER KIT	Toner cartridge is almost empty	
10	PAPER OUT **	Paper empty or paper cassette removed	
11	PAPER JAM	Paper is jammed	
12	COVER OPEN	Upper unit of printer is not closed properly	
13	SERVICE (P1)	PCU ROM checksum error	
14	SERVICE (P2)	PCU RAM read/write error	
15	SERVICE (P3)	Non-volatile RAM read error	
16	SERVICE (P4)	Serial communication error	
17	SERVICE (C1)	Optical system error	
18	SERVICE (C2)	Main motor defective	
19	SERVICE (C3)	Polygon motor defective	
20	SERVICE (C4)	Heater high temperature	
21	SERVICE (C5)	Heater low temperature	
22	SERVICE (C6)	Thermister open	
23	SERVICE (E1)	ICU ROM checksum error	

No.	DISPLAY MESSAGE	MEANING	CONDITION
24	SERVICE (E2)	ICU RAM read/write error	
25	SERVICE (E3)	Expansion memory error	
26	SERVICE (E4)	ICU hardware error read/write	
27	SERVICE (E5)	Non-volatile RAM checksum error	
28	SERVICE (FC)	Font card error	

(3) FUNCTION SET (PRINTING MENU)

No.	DISPLAY MESSAGE	MEANING	CONDITION
1	COPIES = 01	01 → 99	
2	ENVELOPE = COM-10	COM-10, MONARC, DL, C5	
3	AUTO CHANGE = OFF	ON/OFF, TRAY AUTO CHANGE	
4	ORIENTATION = P	[P]Portrait/[L]Landscape	
5	FONT SOURCE = I	[I]Internal font, [A]A slot card, [B]B slot card, [S]Soft font	
6	FONT NUMBER = 00	00 → 50	
7	FORM LENGTH = 060	05 → 128 (line/page)	
8	EXT.MODE = OFF	ON/OFF	

(4) MENU SET (CONFIGURATION MENU)

No.	DISPLAY MESSAGE	MEANING	CONDITION
1	SYM.SET = ROMAN-8	ROMAN-8, IBM-US, IBM-D/N, ECMA-94, ISO2, ISO4, ...	
2	I/F = SERIAL	[SERIAL]/[PARALLEL]	
3	BAUD RATE = 9600	300, 600, 1200, 2400, 4800, 9600, 19200	
4	ROBUST XON = ON	ON/OFF	
5	DTR POLARITY = HI	[HI]High/[LO]Low	
6	NATIONAL = U.S.A.	U.S.A., FRANCE, GERMANY, ENGLAND, DNMRK1, SWEDEN, ITALY, SPAIN, JAPAN, NORWAY, DNMRK2, D/N	
7	AUTO FEED = OFF	ON/OFF	
8	FIX SELECT = OFF	ON/OFF	
10	EMULATION = HPLJ2	HPLJ2, FX80, IBMPP, IBMGP, D630, HEX	

(5) MENU SET (EMULATION MENU)

No.	DISPLAY MESSAGE	MEANING	CONDITION
1	AUTO LF = OFF	ON/OFF	
2	AUTO CR = OFF	ON/OFF	
3	ZERO = "0"	"0"/"Ø"	
4	CODE BIT = 8	[7]bit, [8]bit	
5	CHR.PITCH = 10	[10]cpi, [12]cpi, [15]cpi, [PS]pitch	

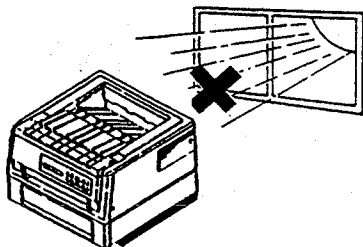
[3] UNPACKING AND INSTALLATION

1. Installation requirements:

Please note the following requirements when installing the printer.

1) Machine Environment

- ① Avoid installation in direct sunlight or bright locations near a window.
Direct sunlight may cause the plastic components to deform or discolor.
Use a curtain or shade to block the light. Frosted glass may also produce the same effect.



- ② Avoid installation in a hot, damp place or where rapid changes in humidity occur (for example; near an air conditioner).
This may cause paper to dampen or frost to occur inside the printer, and may lead to a misfeed and a deterioration in the print quality.

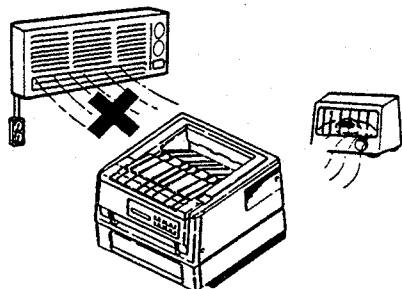
The recommended environmental conditions are:

20 to 25°C (68 to 77°F.), 65%±5%RH.

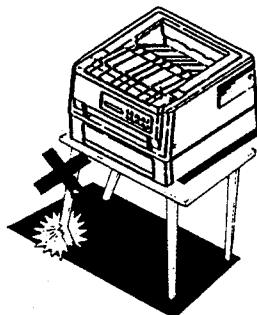
The nominal environment conditions are:

10 to 30°C. (40 to 86°F.), 20 to 85%RH.

If the temperature is 35°C. (95°F), the humidity should be 60%.



- ③ The toner density and print quality may be affected unless the machine is installed in a level condition.
- ④ Avoid installation in a place where dust or vibration is encountered.
Dust deposits inside of the printer may lead to a deterioration of print quality or machine trouble.
- ⑤ Do not install the printer on an unstable or uneven surface.
The printer must be placed on a level surface to permit proper functioning.

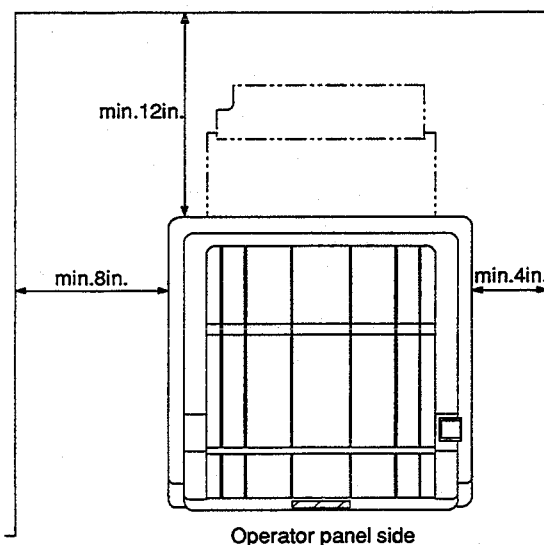


- ⑥ Avoid installation in a place where the ventilation or air circulation is poor.
- ⑦ Never install the printer near inflammable materials or in the presence of ammonia fumes.
Installation near a diazo copy machine may lead to a deterioration of print quality or a machine malfunction.
- ⑧ Install the printer near the wall outlet.

2) Space around the printer

When installing, allow enough space around the printer for proper operations. Especially take notes on the following:

- Allow a space of 12 inches or more in the rear side of the printer for open/close of the face up tray and paper exit when the face up tray is used.
- Allow a space of 8 inches or more in the left side of the printer for ventilation of the cooling fan.



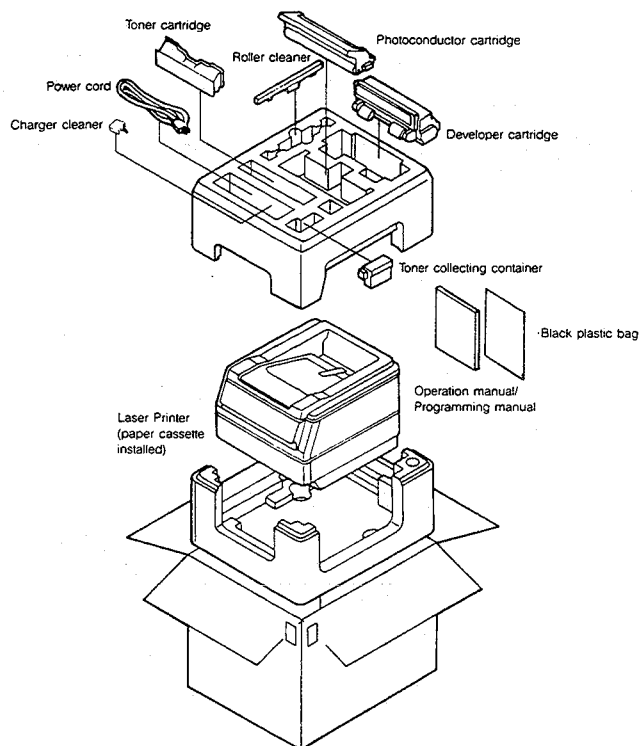
3) Power source

- ① The power supply line should have a capacity of more than 6A (120V), 3.2A (220V), 3.0A (240V), capable of supplying more than 90% of the rated voltage at full load.
- ② Do not use an extension cord, or operate any other equipment from the same wall outlet.
- ③ Use a properly grounded (three prong) wall outlet only.

2. Unpacking and installation procedures

NOTE: Metallic surface of the printer might frost due to a abrupt temperature change when the machine is brought inside the room during cold weather and may lead to a paper misfeed or print quality deterioration. Leave the carton unopened in such a case and leave it in the room for more than one hour before opening the carton.

1) Packing structure



- NOTE:**
- Save the carton and packing materials. They should be used to repack and protect the Laser Printer if it must be shipped for servicing.
 - The black plastic bag is used for shipping. The charger cleaner is used for maintenance. Store them in suitable places.

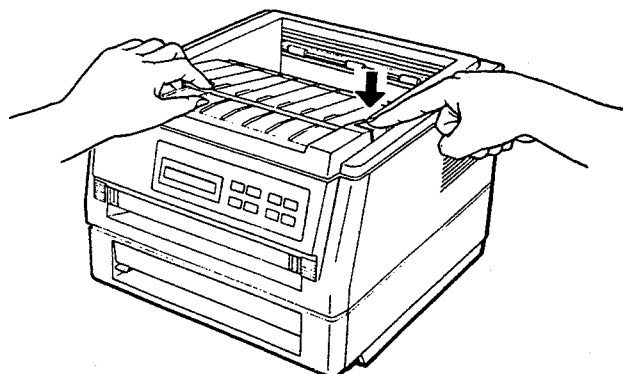
2) Setting up

INSTALLING THE SUPPLIES

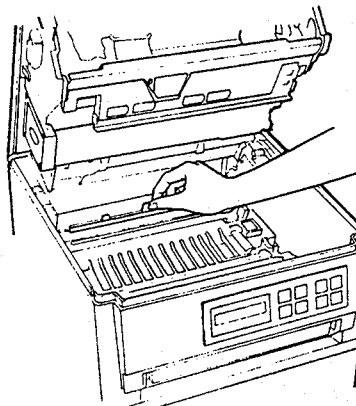
NEVER TOUCH THE MG ROLLER SECTION OF THE DV CARTRIDGE WITH FINGERS.

Installing the Roller Cleaner and the Toner Collecting Container (waste toner box)

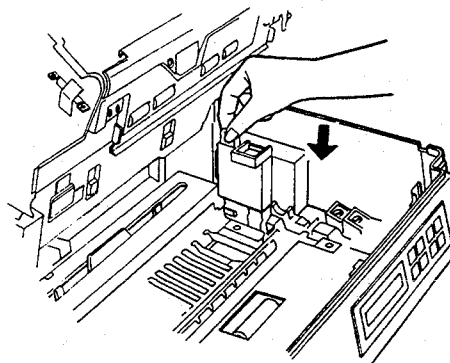
1. Hold the top of the Laser Printer and press the **upper unit release button** to open it.



2. Remove the roller cleaner from its plastic bag.
3. Install the roller cleaner on top of the fusing unit.

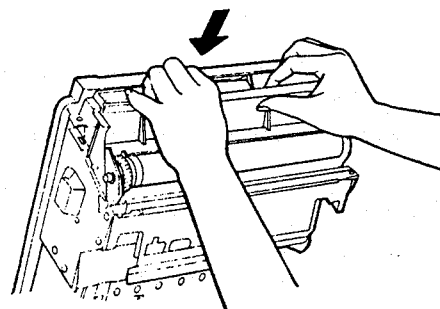


4. Install the toner collecting container.

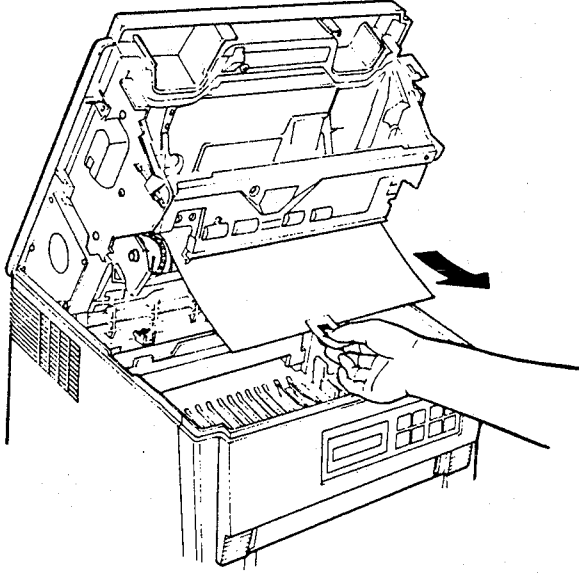


Installing the Photoconductor Cartridge

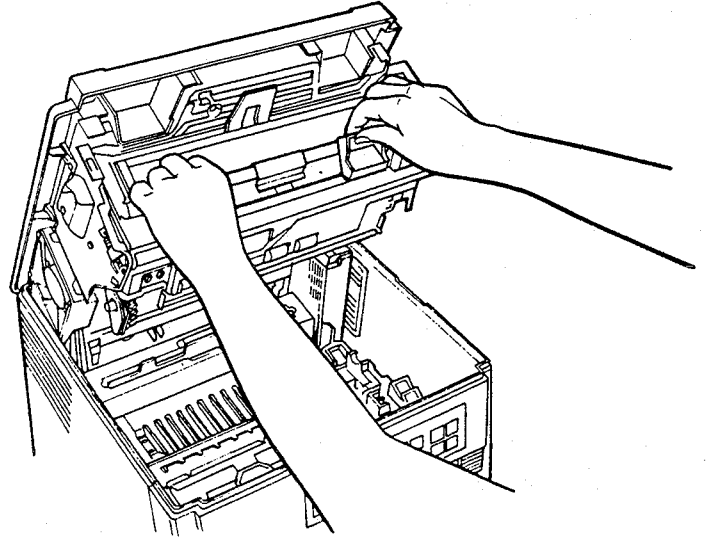
1. Remove the photoconductor cartridge from its plastic bag. **BE CAREFUL NOT TO TOUCH THE PHOTOCONDUCTIVE DRUM.**
2. With the photoconductive drum facing down, insert the photoconductor cartridge into the Laser Printer, sliding it along the guides.



3. Hold the upper unit and pull the green tab to remove the protective sheet.

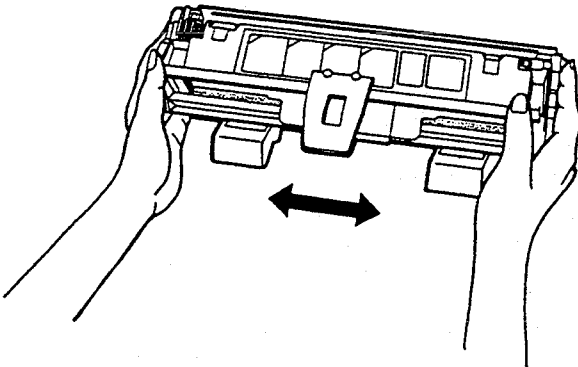


4. Press the levers on the developer cartridge with both hands and slide it into the Laser Printer along the guides.

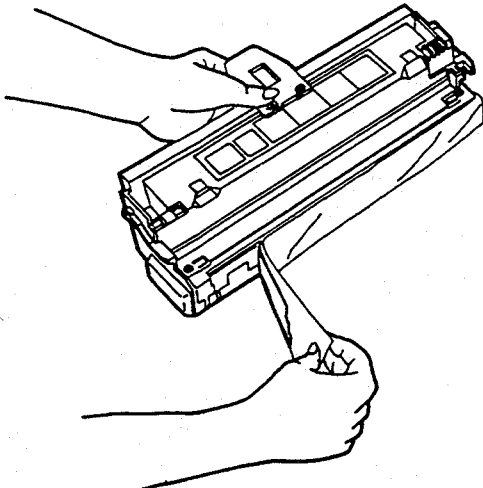


Installing the Developer Cartridge

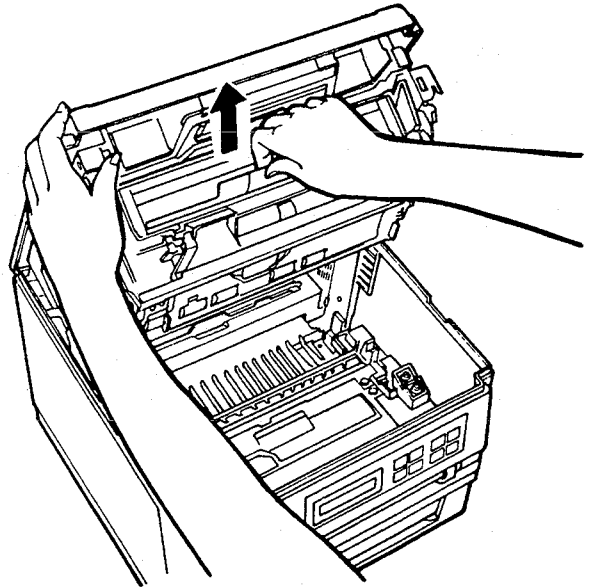
1. Remove the developer cartridge from its plastic bag, taking care not to damage it.



2. Shake the developer cartridge horizontally four or five times.
3. Place the developer cartridge on a level surface, hold it in place, and remove the covering material.
 - Be careful not to touch the developer roller.
 - Do not remove the sealing plate on the other side of the developer cartridge.

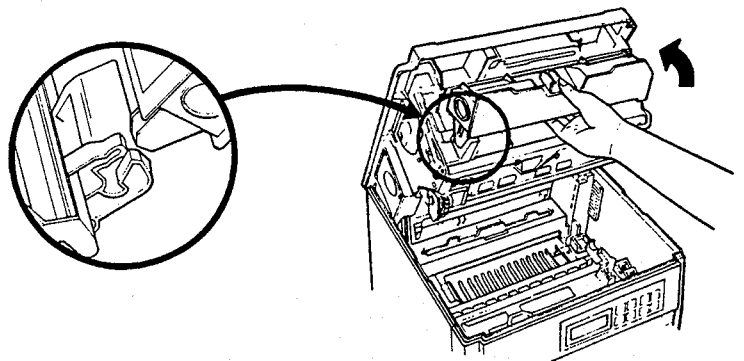


5. Remove the tape securing the sealing plate and pull out the sealing plate.

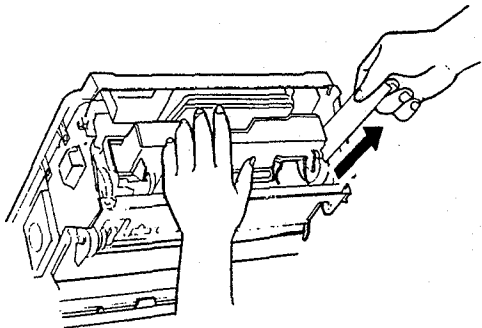


Installing the Toner Cartridge

1. Shake the toner cartridge horizontally four or five times.
2. Align the toner cartridge slots with the developer cartridge hooks. Rotate the toner cartridge until it clicks and is securely attached.



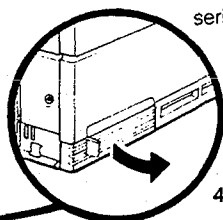
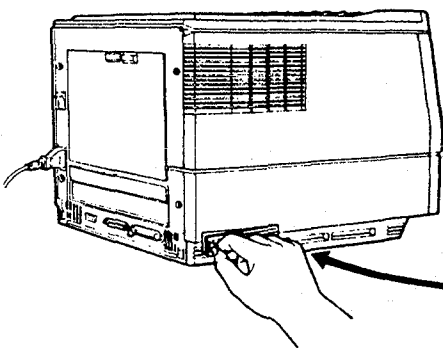
3. Hold the toner cartridge and pull out the sealing tape from the toner cartridge.
Tap on the toner cartridge four or five times to release all the toner into the developer cartridge.



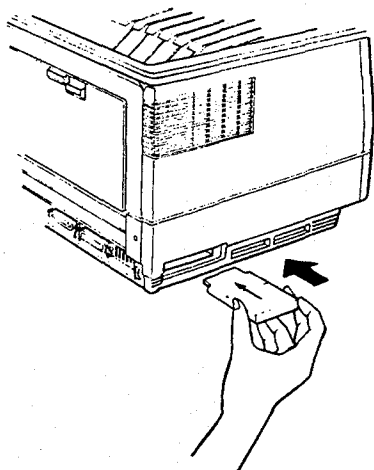
4. Close the Laser Printer.

INSTALLING THE EXPANSION MEMORY (OPTIONAL)

1. Turn off the power.
2. Remove the expansion memory cover on the bottom left-hand side of the Laser Printer by pulling the cover tab to the right and out.



3. Insert the expansion memory, with the arrow facing up, all the way into the Laser Printer.



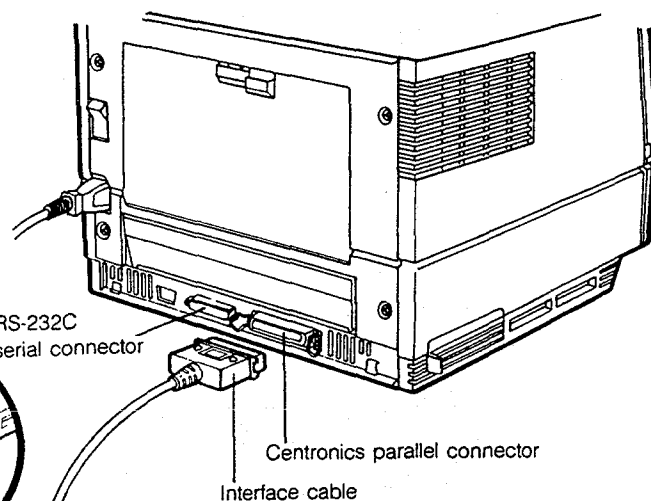
4. Replace the expansion memory cover.
 - If the cover cannot be replaced, the expansion memory may be improperly inserted (upside down).
5. Perform SELF TEST #1 to check that the expansion memory is properly installed.

CONNECTING THE INTERFACE CABLE

The Laser Printer is equipped with both a Centronics parallel and a RS-232C serial interface. The Laser Printer has been set at the factory to use the Centronics parallel interface. To set the RS-232C serial interface, see [13]-11, MENU SETTING STRUCTURE.

Note: A shielded, grounded cable and connector are required to comply with either FCC Class B or VDE 0871 and 0875 requirements.

1. Turn off the power
2. Remove the protective cover from the desired connector. (Leave the other protective cover in place to prevent accidental contact, and damage from static electricity.)
3. Plug the cable into the connector.

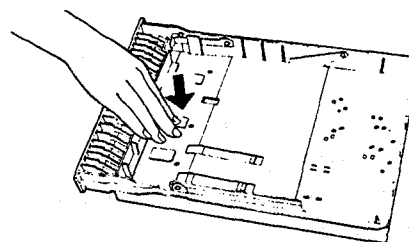


4. Fasten the bail clips for the parallel connector or secure the two screws for the serial connector.

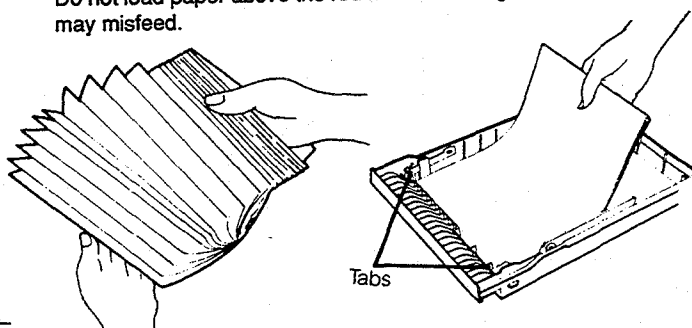
LOADING PAPER

The paper cassette feeds paper for automatic feeding and can hold about 250 sheets of standard weight paper (16 to 21 lbs. or 60 to 80g/m² weight).

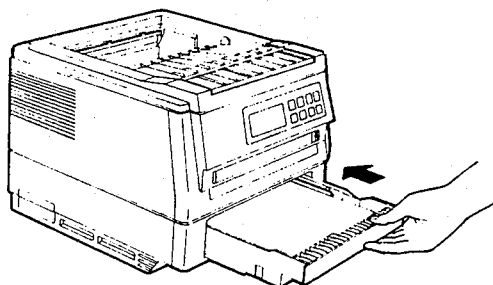
1. Push the pressure plate until it locks in position.



2. Fan up to 250 sheets of standard paper.
 3. Place the paper in the cassette with the corners under the metal corner tabs. Remove some paper if the paper is tight under the metal corner tabs. Shake the paper cassette gently to straighten the paper.
- * Note the side facing down is the printing side.
- * Do not load paper above the red maximum height line, or paper may misfeed.



- Slide the paper cassette into the Laser Printer until it clicks in place.



PRINTER SELF-TESTS

After you have performed all the installation procedures for the Laser Printer, we recommend that the self-tests be performed to check printing. There are two self-tests: SELF TEST #1 and SELF TEST #2.

SELF TEST #1 prints the selected menu items and values.

SELF TEST #2 prints an entire sheet of characters in a test pattern using the internal character set.

To perform these tests, check that the:

- * supplies are installed.
- * paper cassette is loaded with letter size paper.
- * Laser Printer is connected to a power outlet.

(A computer is not required for these tests.)

NOTE: In this manual, underlined values given in display messages may vary according to your configuration or settings.

Entering the Self-Test Mode

- Press the power switch to turn on the power.
 - * "WARMING UP" appears on the display.
 - * In about 6 seconds, the ON LINE lamp lights, the READY lamp lights, and "READY (LJ2)T" (LJ2 = HP LaserJet series II) appears on the display.
- Press the LINE key to set the printer off-line.
 - * The ON LINE lamp turns off.
 - * "TRAY = LETTER" appears on the display.

SELF-TEST #1

- Press and hold the PRINT FONTS/TEST key until the display shows "SELF TEST #1".
 - * The DATA lamp lights and printing begins.
 - * The printed sheet listing the menu settings (e.g. type of interface, emulation, etc.) is output, and the DATA lamp turns off.
 - * When printing is complete, "READY (LJ2)T" appears on the display.

SELF-TEST #2

- Press the PRINT FONTS/TEST key until the display shows "SELF TEST #2".
 - * The DATA lamp lights and printing begins.
 - * The printed test pattern is output, and the DATA lamp turns off. Check that the printout is similar to the one shown below.

SHIPPING INSTRUCTIONS

Follow the procedure below whenever transporting or shipping the Laser Printer.

- Press the **upper unit release button** to open the Laser Printer.
- Remove the toner, developer, and photoconductor cartridges and the toner collecting container.

NOTE: Any time the photoconductor cartridge is removed from the printer, it must be put in the black plastic bag included with the original packing materials. This is required to prevent the photoconductor from being overexposed to ambient light.

- Remove the paper from the paper cassette, and secure the pressure plate with tape.
- Close the Laser Printer.
- Pack the printer, reversing the order of UNPACKING instructions on page 6.

NOTES:

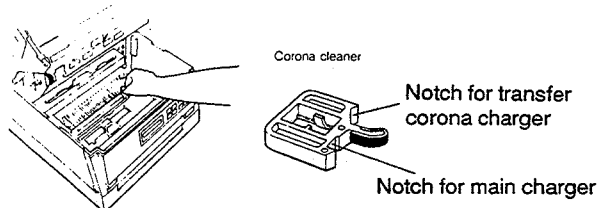
- When returning the printer for repair include:
 - A written explanation of the problem encountered.
 - Any print samples which may help in diagnosing the problem.
- Do not include any cartridges (toner, developer, or photoconductor) or the toner collecting container when returning the printer for servicing, unless specifically requested by SHARP.

CLEANING

- Cabinet**
When the Laser Printer cabinet becomes dirty or stained, wipe with a soft, clean cloth. If necessary, dampen the cloth with water. Do not use thinner, benzene, or similar volatile cleaning agents.
- Corona Wires**
If the printouts are blotchy or streaky, dirty corona wires may be the cause.

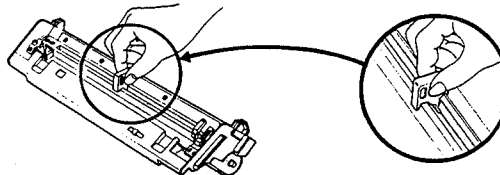
(Transfer corona charger)

- Turn off the power.
- Press the **upper unit release button** to open the Laser Printer.
- Slide the corona cleaner with the notch for the transfer corona charger resting on the corona wire case as shown below.



(Main charger)

- Carefully pull out the toner and developer cartridges.
- Carefully pull out the photoconductor cartridge and place it on a level surface.
 - * Do not touch the photoconductor drum.
- Slide the corona cleaner with the notch for main charger resting on the corona wire case as shown below.



- Reinstall the photoconductor cartridge, toner and developer cartridges, replace the cleaner, and close the Laser Printer.

[4] SUPPLIES

1. Kinds of papers

Standard Papers

- Automatic Feeding from the Paper Cassette

Sizes				
Inch series	Invoice	Executive	Letter	Legal
	8-1/2" x 5-1/2"	7-1/4" x 10-1/2"	8-1/2" x 11"	8-1/2" x 14"
AB series	B5	A4		
	182 x 257mm	210 x 297mm		
Weights	16 lbs ₂ 60 g/m ²	↔	21 lbs ₂ 80 g/m ²	

- The letter or A4 size cassette is a standard accessory on the printer. Cassettes in other sizes are available as options.

- Manual Feeding

Sizes Same as automatic feeding

Weights	16 lbs 60 g/m ²	↔	34 lbs 130 g/m ²
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- Papers with weights from 21 lbs. to 34 lbs. (80g/m² to 130 g/m²) can be used only with face up output.
- 8-1/2" x 11" (A4) is the maximum size for paper weighing more than 28 lbs. (105 g/m²).

Envelopes

- Manual Feeding

Size	Commercial 10 (Business) 4-1/8" x 9-1/2" International DL 110 x 220mm	Monarch 3-7/8" x 7-1/2" International C5 162 x 229mm	
Weights	16 lbs. 60 g/m ²	↔	24 lbs. 90 g/m ²

- Envelopes can be used only with face up output.
- An optional envelope feeder is available for continuous feeding of up to 50 envelopes.

2. Drum cartridge, developer cartridge, toner cartridge, waste toner box, cleaning oil pad.

	Name	Description	Product name	Pcs/pack	Life	Storage period
1	Drum cartridge	Drum cartridge x 1 Instructions x 1	JX-95DRD	5	*1	24 months after the production month (not unpacked) (Condition) Humidity: 10~90% Temperature: -10~40°C
2	Developer cartridge	Developer cartridge x 1	JX-95DCD	5	*2	
3	Toner kit	Toner cartridge x 1 Waste toner box x 1 Cleaning oil pad x 1	JX-95TCD	5	*3	

- *1: Maximum print life is 50,000 pages.
- *2: Maximum print life is 25,000 pages.
- *3: A4 (8-1/2" x 11"), 4% black image area, 3,000 pages

Special Papers

	Transparency film	(manual feed and face up paper output only)
Sizes	Letter (8-1/2" x 11")	A4

- Use transparency films with backing paper.
 - Special papers can be used only with face up output.
- Do not use the following kinds.
- Paper not mentioned above.
 - Surface coated paper
 - Paper with crease, scratch, stapled, perforation.

[5] OUTLOOK AND INTERNAL STRUCTURE

1. Outlook (Front)

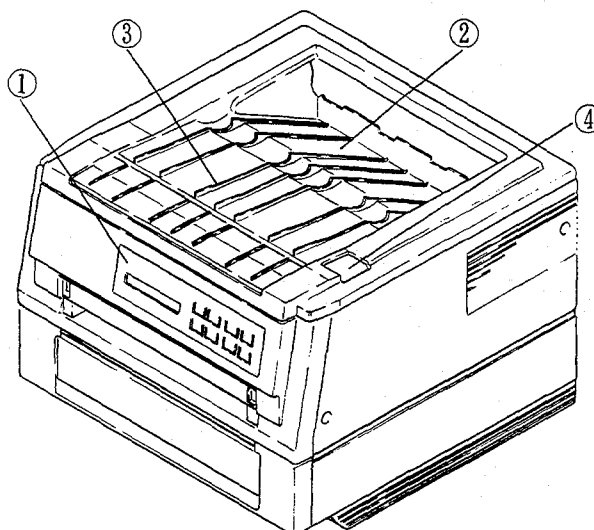


Fig. 5-1

①	Operation panel	②	Facedown tray	③	Legal extension tray
④	Opener				

2. Outlook (Rear)

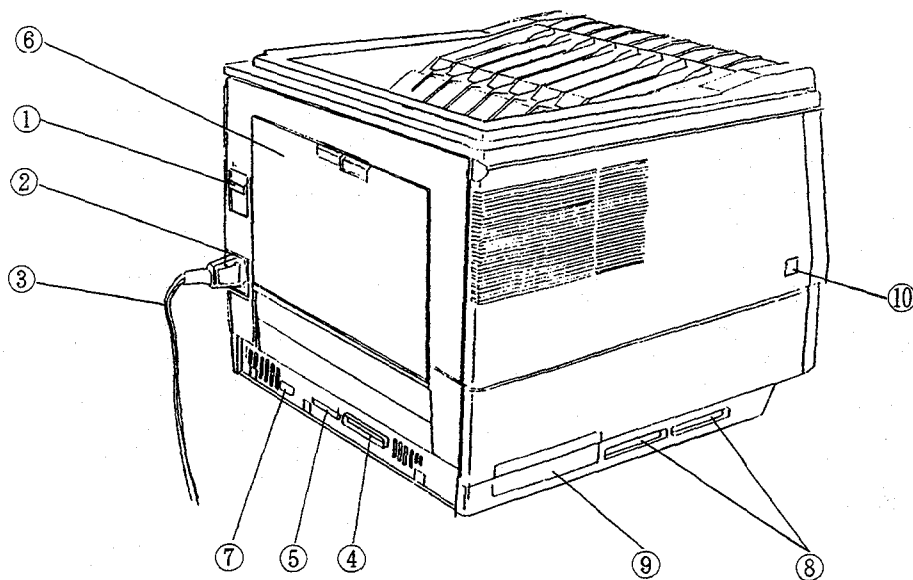


Fig. 5-2

①	Power switch	②	AC inlet	③	Power supply cord
④	Centronics interface	⑤	RS232C interface	⑥	Faceup tray
⑦	Second cassette connector	⑧	Font card inlet	⑨	Expansion memory door
⑩	Envelop feeder connector				

3. Open view

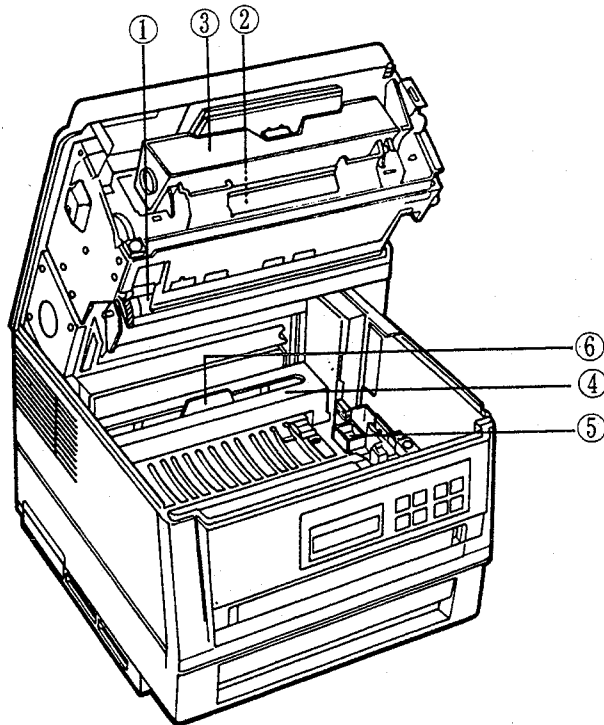


Fig. 5-3

①	Drum cartridge	②	Developer cartridge	③	Toner cartridge
④	Fuser unit	⑤	Waste toner box	⑥	Cleaning oil pad

4. Left side section

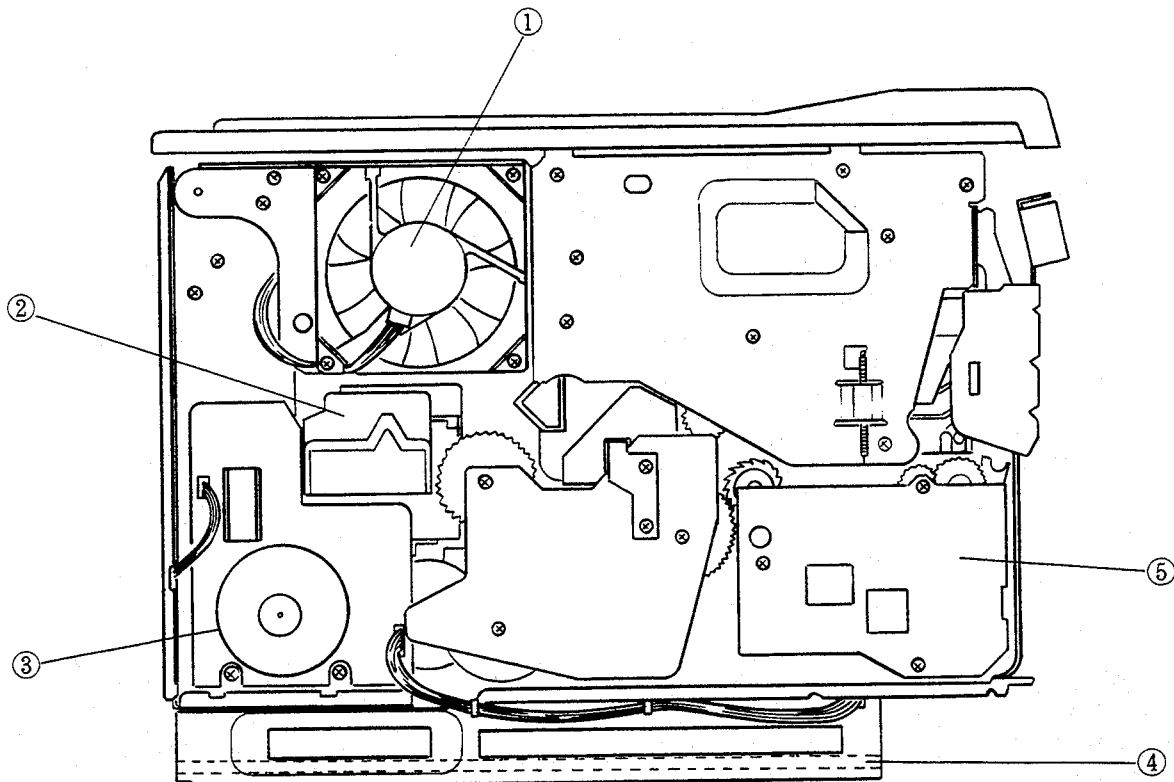


Fig. 5-4

①	Fan motor	②	Fuser unit	③	Main motor
④	ICU PWB	⑤	Solenoid PWB		

5. Right side section

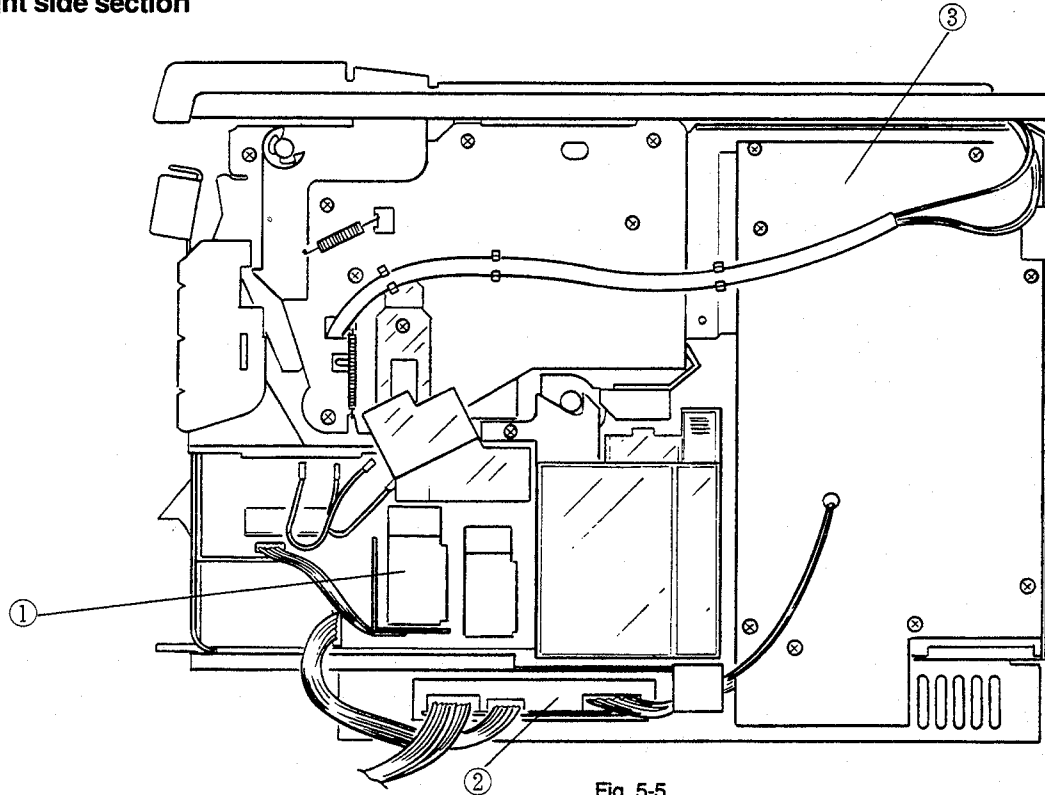


Fig. 5-5

①	High voltage unit	②	PCU + DC2 supply unit	③	AC/DC1 power supply unit
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6. Cross section

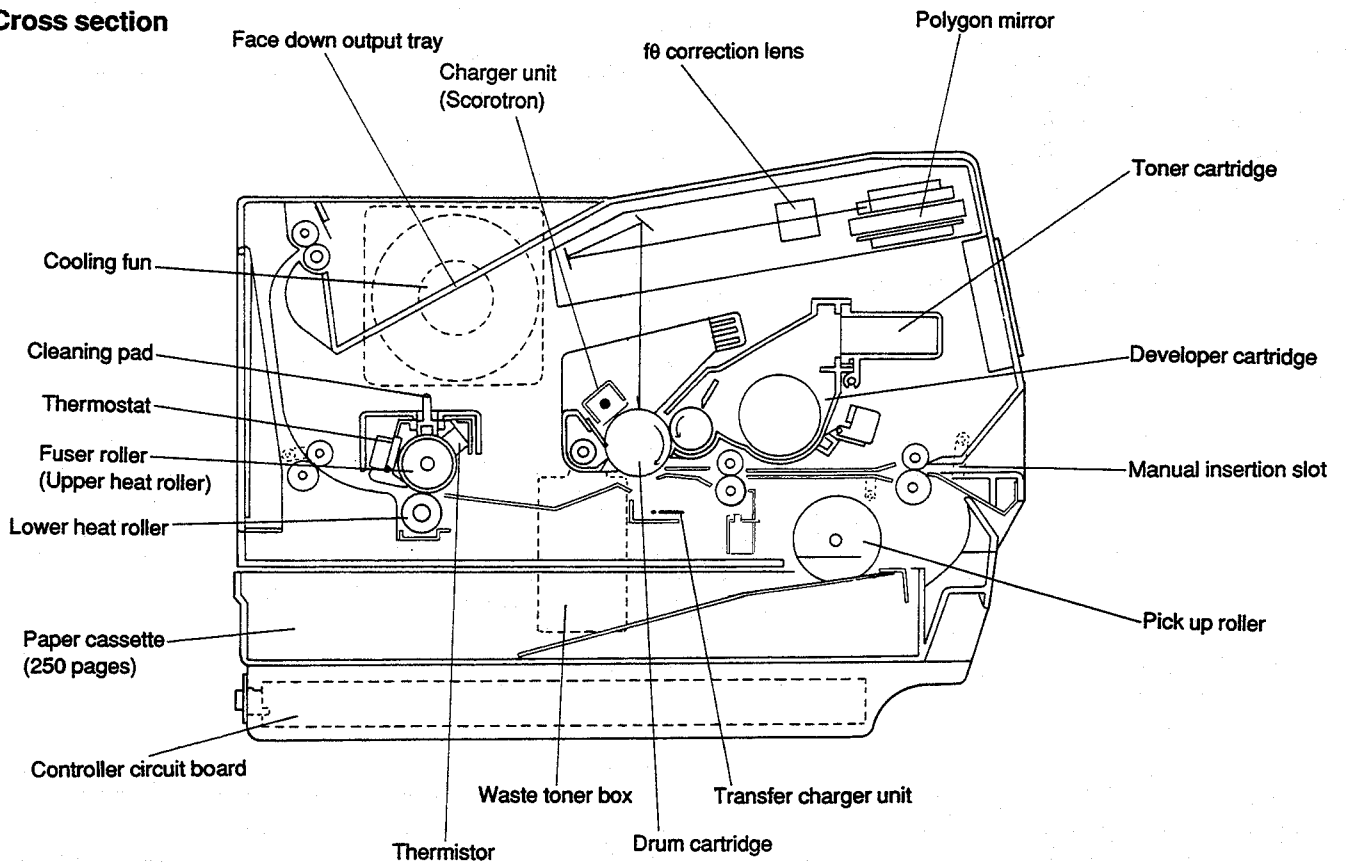


Fig. 5-6

7. Switch, sensor, solenoid locations

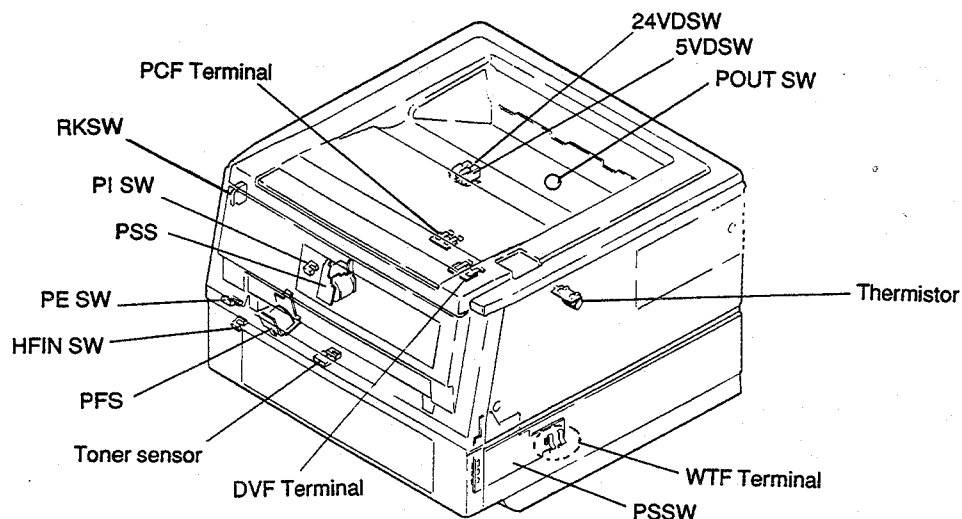


Fig. 5-7

Name	Type	Function
PISW	Switch	Paper entry sensor
POUTSW	Switch	Paper exit sensor
PESW	Switch	Paper empty sensor
PSSW	Switch	Cassette size detection
24VDSW	Microswitch	24V line safety switch (MM, HVU)
Toner sensor	Magnetic sensor	Toner concentration sensor
Thermistor	Thermistor	Upper heat roller surface temperature sensor
PFS	Solenoid	Cassette paper feed solenoid
PSS	Solenoid	Paper stop solenoid
PCF terminal	Terminal	Drum cartridge fuse terminal
DVF terminal	Terminal	Developer cartridge fuse terminal
HFIN SW	Switch	Manual paper entry sensor
WTF terminal	Terminal	Waste toner box fuse terminal
5VDSW	Microswitch	5V line safety switch (LSU)
RKSW	Microswitch	Upper frame open detect switch

8. Motor, transformer, lamp locations

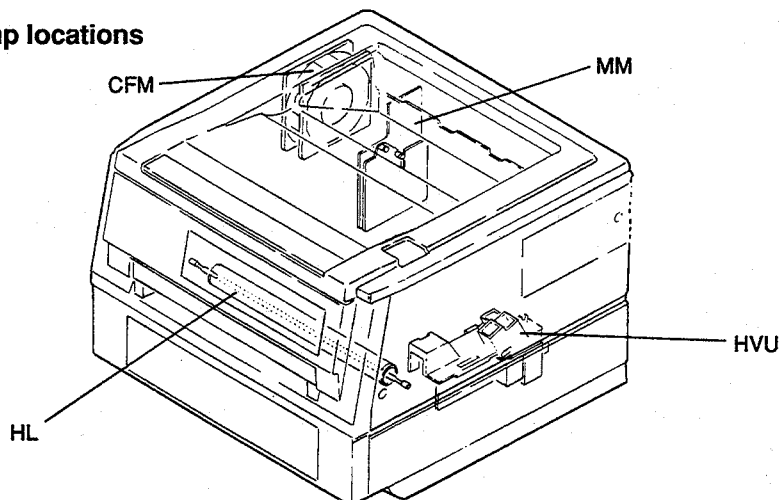


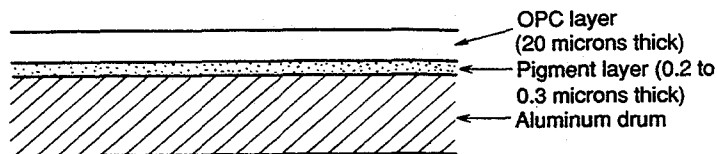
Fig. 5-8

Symbol	Name	Function
MM	Main motor	Load drive motor.
HVU	High voltage units	Main corona and transformer corona high voltage supply units
HL	Heater lamp	For heat roller heating
CFM	Cooling fan motor	Cooling, Ventilation

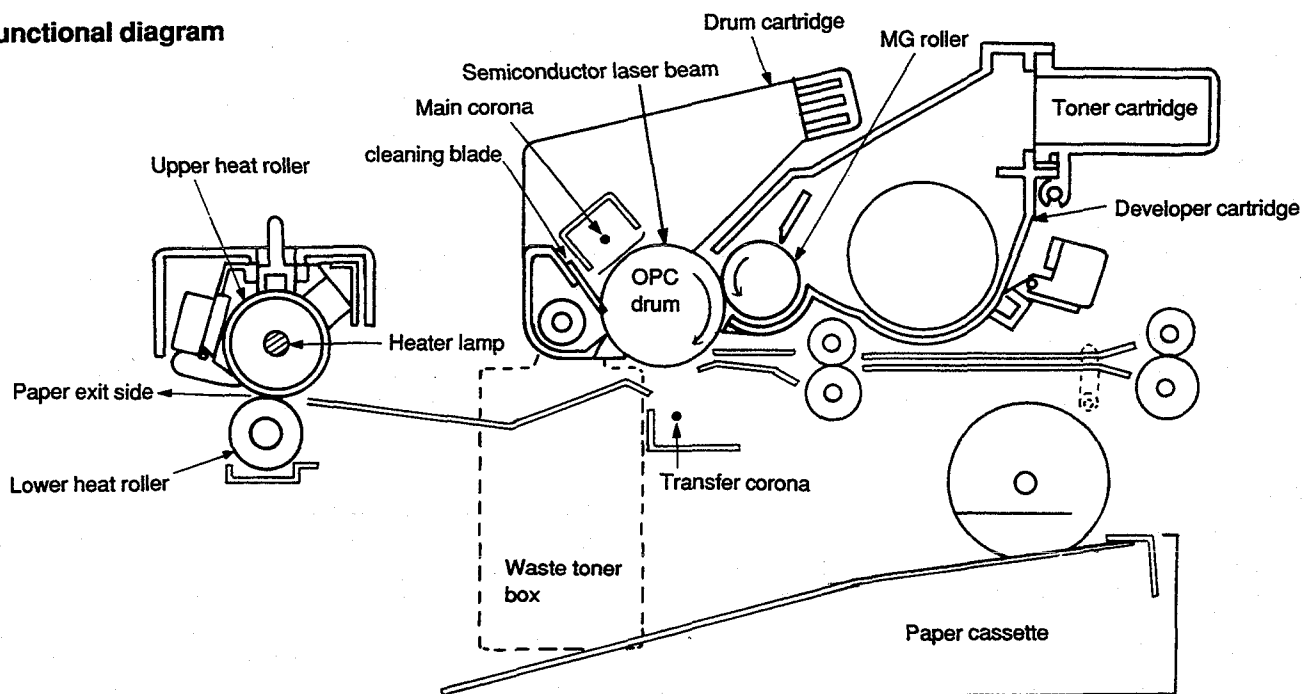
[6] PRINT PROCESS

An OPC drum is used for the photoconductor.

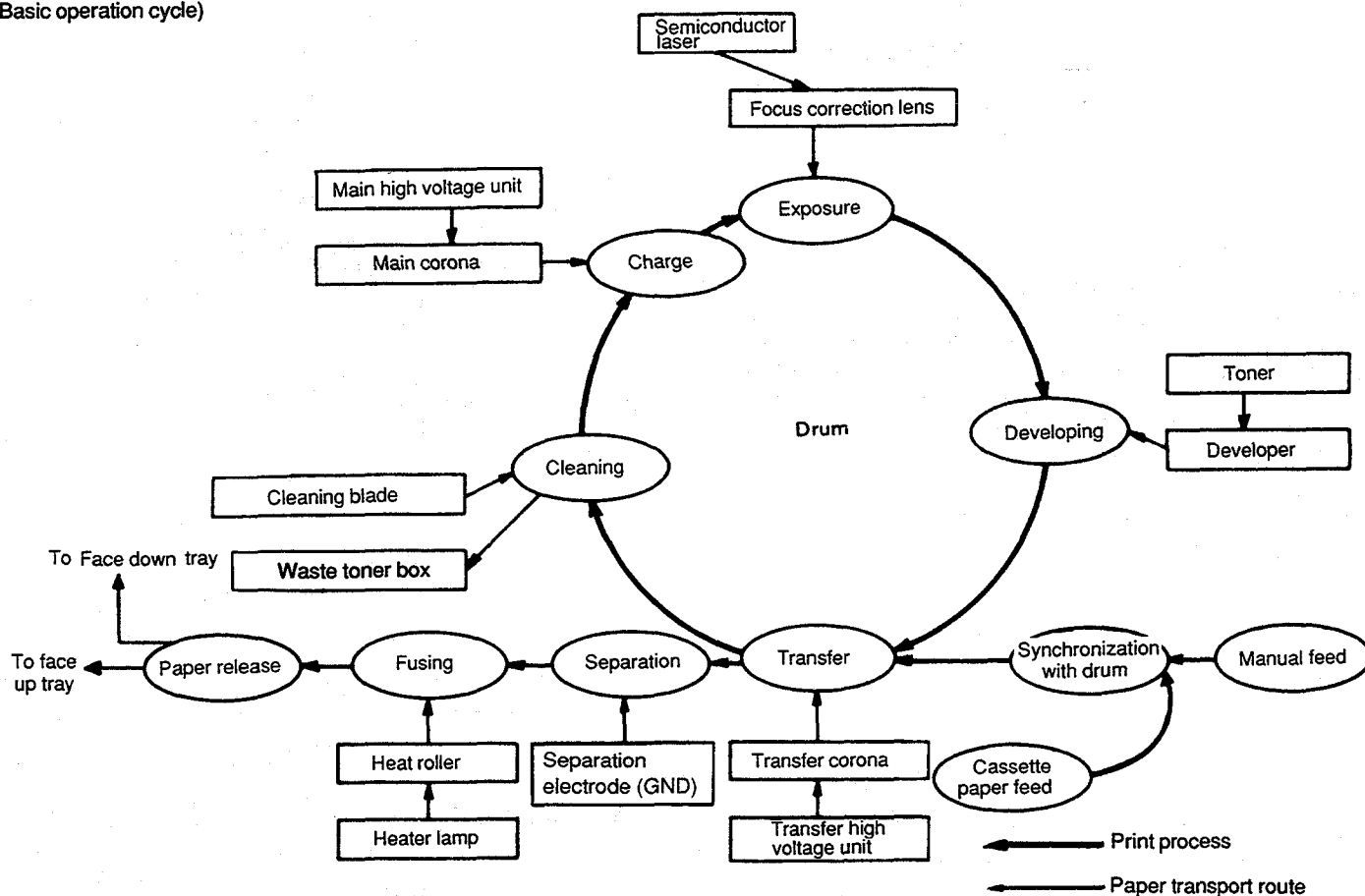
(Structure of the OPC drum layers)



1. Functional diagram



(Basic operation cycle)



2. Image forming process steps

The JX-9500 is a non-impact printer that uses the semiconductor laser and electrostatic print process and uses an OPC (Organic Photo Conductor) for its photoconductive material. First, corona from the main corona unit charges the drum surface and a latent image is formed on the drum surfacing using a laser beam. This latent image forms a visible image on the drum surface with toner. The toned image is then transferred onto the print paper by the transfer corona and fixed on the print paper using the fuser roller, and pressure.

Step-1: Charge

Step-1: Charge
Step-2: Exposure } Latent image is formed on the drum.

Step-2: Exposure

Step-3: Developing

Latent image formed on the drum is then changed into visible image with toner.

Step-4: Transfer

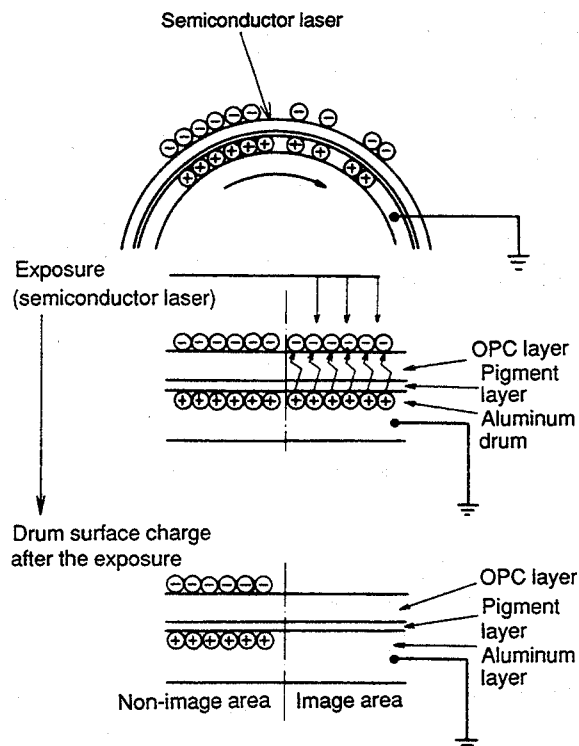
The visible image (toner image) on the drum is transferred onto the print paper.

Step-5: Cleaning

Residual toner on the drum surface is collected by the cleaning blade.

Step-6: Optical discharge

Residual charge on the drum surface is removed, by semiconductor laser beam.

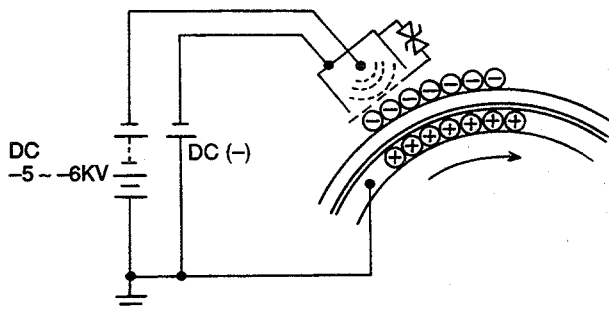


3. Basic print process

Step-1: DC charge

A uniform negative charge is applied over the OPC drum surface by the main corona unit. Stable potential is maintained by means of the Scorotron charger.

Positive charges are generated in the aluminum layer.



Step-2: Exposure (laser beam, mirror, lens)

A Laser beam is generated from the semiconductor laser with the print pattern signal. It is exposed onto the OPC drum surface through the mirror and lens. The resistance of the OPC layer decreases for an area exposed by the laser beam (corresponding to the print pattern signal). The beam neutralizes the negative charge. The electrostatic latent image is formed on the drum surface.

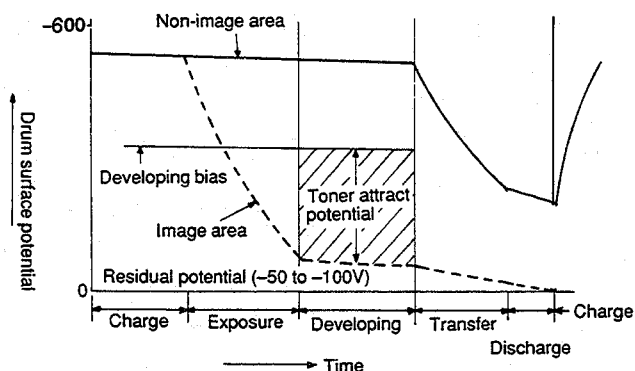
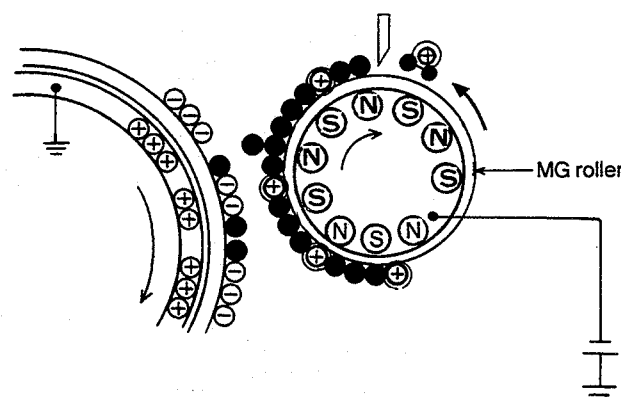
Step-3: Developing (DC bias)

A bias potential is applied to the MG roller in the two component magnetic brush developing method, and the toner is charged negative by friction with the carrier.

Non-image area of the drum surface charged with negative potential repel the toner, whereas the bright exposed portions where there are no negative charges exist are developed by the toner. As a result, a visible image appears on the drum surface.

A small quantity of carrier is on the sleeve.

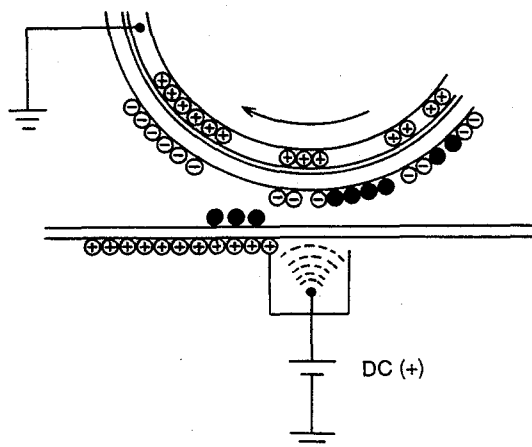
- ⊕ : Carrier (magnetized particle)
- : Toner (charge negative by friction)
- (N) (S) : Permanent magnet (provided in three locations)



Toner is attracted over the shadowed area because of the developing bias.

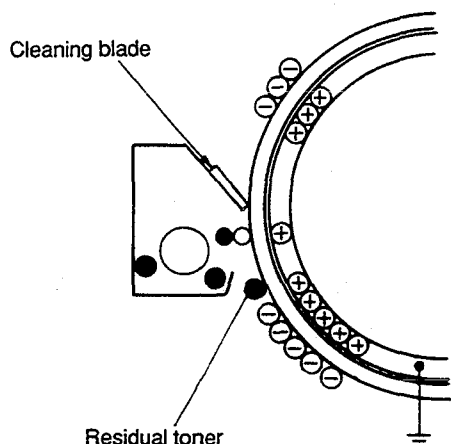
Step-4: Transfer

The visible image on the drum surface is transferred onto the print paper by applying a positive charge from the transfer corona to the back of the print paper.



Step-5: Cleaning

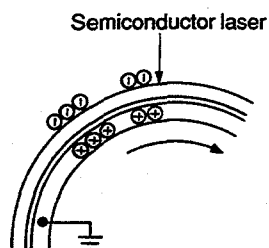
Toner remaining on the drum is collected by the cleaner blade and transported to the waste toner box, by the waste toner transport screw.



Step-6: Optical discharge (Semiconductor laser)

Before the drum rotation is stopped, semiconductor laser is radiated onto the drum to reduce the electrical resistance in the OPC layer and eliminate residual charge, providing a uniform state to the drum surface.

When the electrical resistance is reduced, positive charges on the aluminum layer are moved and neutralized with negative charges on the OPC layer.



Charge by the Scorotron charger

Function

The Scorotron charger maintains the surface potential of the drum. It is used to control the surface potential regardless of the charge characteristics of the photoconductor.

Basic function

A screen grid is provided between the corona wire and the photoconductor, a stable voltage is added to the grid to apply the corona current to the photoconductor and the grid.

As the photoconductor is charged by the corona from the main corona unit, the surface potential increases. This increases the current flowing through the screen grid. When the photoconductor potential nears the grid potential, the entire current flows to the grid so the photoconductor potential can be maintained at a stable level.

Process controlling

Function

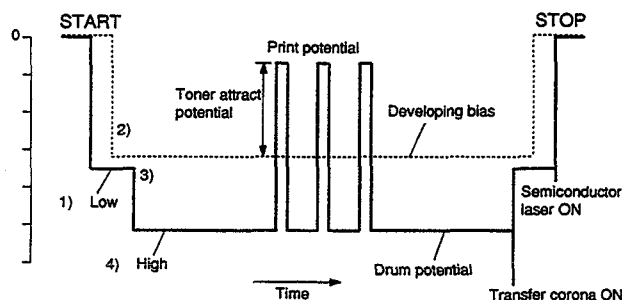
Print pattern signal is converted into a visible image by the semiconductor laser using negative to positive (reversible) developing method. Therefore, if the developing bias is added before the drum is charged, toner is attracted onto the drum. If the developing bias is not added when the drum is charged, the carrier is attracted to the drum because of the strong electrostatic force of the drum.

To avoid this, the process is controlled by adjusting the drum potential and the grid potential of the Scorotron charger.

Basic function

Voltage added to the screen grid can be selected, high and low.

To make it easily understood, the figure below shows voltage transition at the developer unit.



Start

- 1) The grid potential and the drum potential is at low level. (Carrier may not be attracted, though the carrier is pulled towards the drum by the electrostatic force.)
- 2) Developing bias is added when the drum potential is at a low level.
- 3) Even if the developing bias is added, toner deposit will not occur because the bias voltage is higher than the drum potential.
- 4) After the developing bias is added, the grid voltage changed from low to high, but the toner and developer may not be attracted.

Stop

- 1) After completion of printing, more than one turn of the OPC drum is uniformly charged at high level.
- 2) Only the portion uniformly charged at high level is adversely charged to low level by the transfer corona.
- 3) When the portion discharged by the transfer corona passes the main corona section, the grid voltage is changed over to LOW output.
- 4) When the LOW grid voltage output area on the OPC drum passes the developer section, the developing bias is turned off.

- 5) The OPC drum is optically discharged more than one turn by the semiconductor laser and is stopped.

Retaining developing bias at an abnormal occurrence

Function

The developing bias will be lost if the power supply is shut off during printing due to a power supply failure. In this event, the drum potential slightly abates and the carrier makes deposits on the drum because of strong static power. To prevent this, the machine incorporates the function to retain the developing bias for a certain period against a possible power supply failure.

Basic function

Normally, the developing bias voltage is retained for a certain time before the drum comes to a complete stop, if the machine should stop before completing the normal print cycle. In this way, the developing bias can be added before resuming the operation after an abnormal interruption. No carrier will therefore make a deposit on the drum surface.

[7] OPERATIONAL DESCRIPTIONS

1. Paper feed block and paper transport block

Fig. 7-1 shows the cross section of the laser printer. In this section, the paper transport is described.

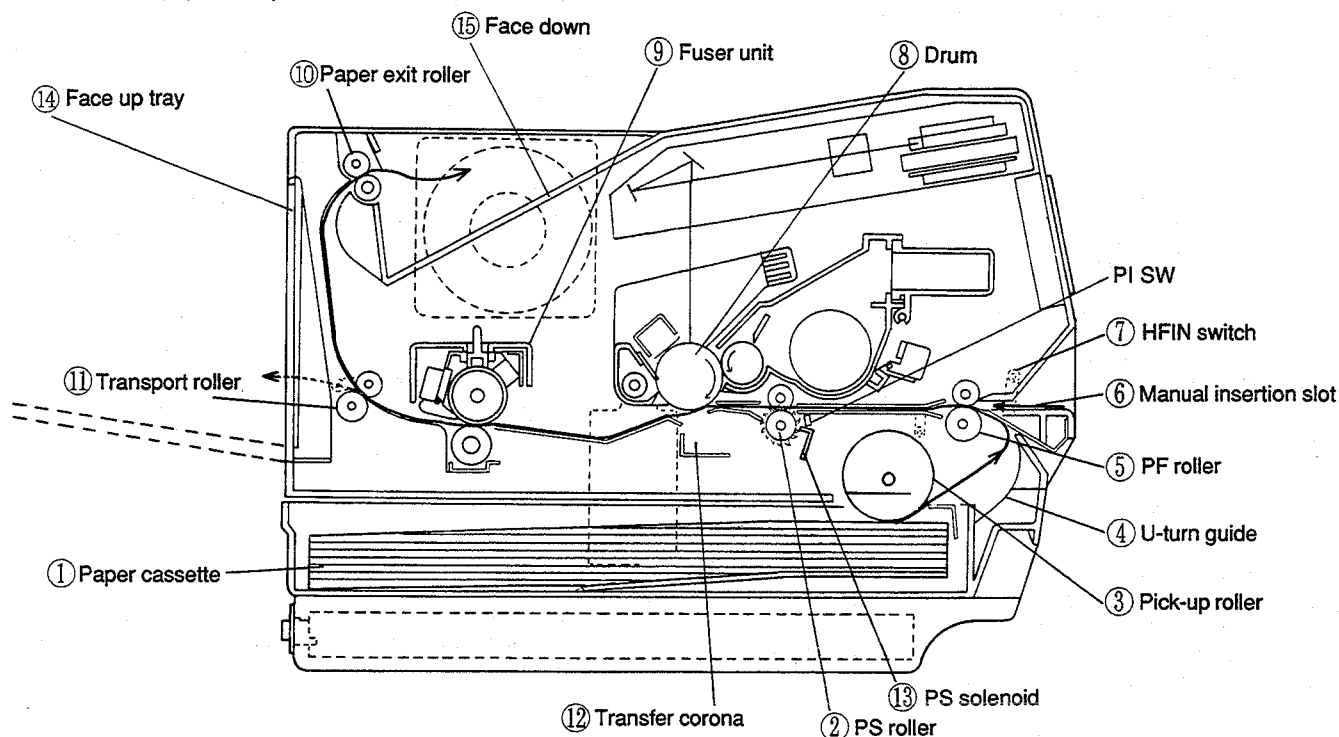


Fig. 7-1

There are two paper feed systems available: the automatic paper feed and the manual paper feed.

There are two paper exit systems: face up and face down.

A paper is taken by the pick-up roller ③ from the paper cassette ① and is fed along the U-turn guide ④ to PF roller ⑤. The paper is then fed by PF roller ⑤ along the paper transport path to PS roller ②, where it is stopped to adjust print timing and alignment. Then, PS solenoid ⑬ is pulled to allow PS roller ② to rotate and the paper is fed to the drum ⑧. Images on the Drum ⑧ are transferred to the paper by transfer corona ⑫. The paper with transferred images on it is fed to fuser unit ⑨, where the images are fused.

The fused paper is fed to transport roller ⑪. If the face up tray ⑭ is open, the paper is fed out in face up mode. If the face up tray ⑭ is closed, the paper is fed further to the paper exit roller ⑩ and fed out to the face down tray ⑮ in the face down mode.

When a paper is fed from the manual insertion slot ⑥, HFIN switch ⑦ is turned on, and the paper is fed from PF roller ⑤ in the same manner as above.

More detailed operational descriptions of the blocks are given below:

1-1. Cassette feed

① Fig. 7-2 and Fig. 7-3 show positions of the pick up roller, the paper feed clutch sleeve, and the paper feed latch after the ready lamp lights.

The paper feed clutch is in contact with the projection of the clutch sleeve.

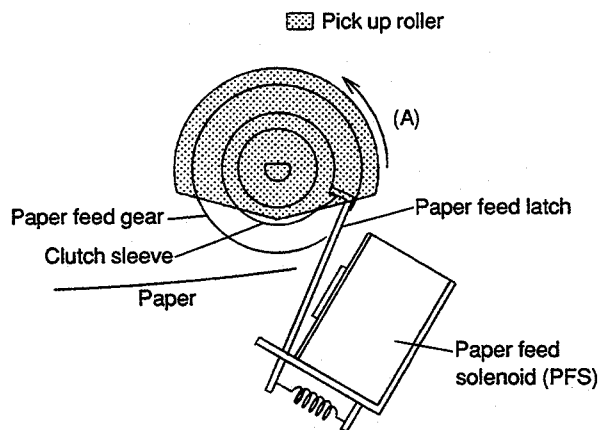


Fig. 7-2

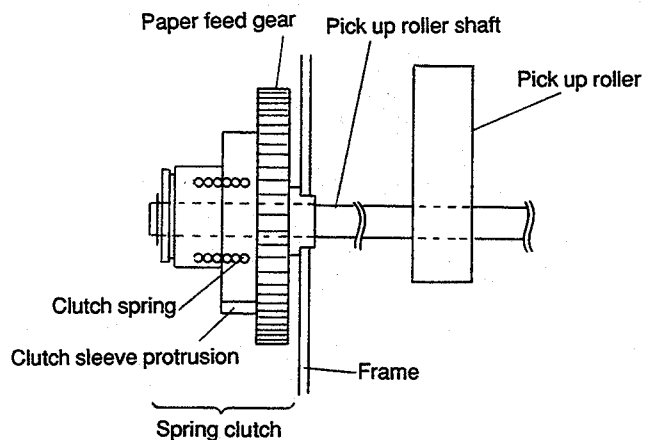


Fig. 7-3

Note: The paper feed drive gear is a one way clutch. Rotation of the paper feed drive gear is transmitted only in direction (A) shown in Fig. 7-2.

- ② When the print command is received, the main drive motor starts to operate each drive gear. The paper feed gear starts to be driven. The rotation of the gear is not conveyed to the paper feed roller shaft and therefore the paper feed roller does not rotate because the paper feed latch is holding the clutch sleeve protrusion.

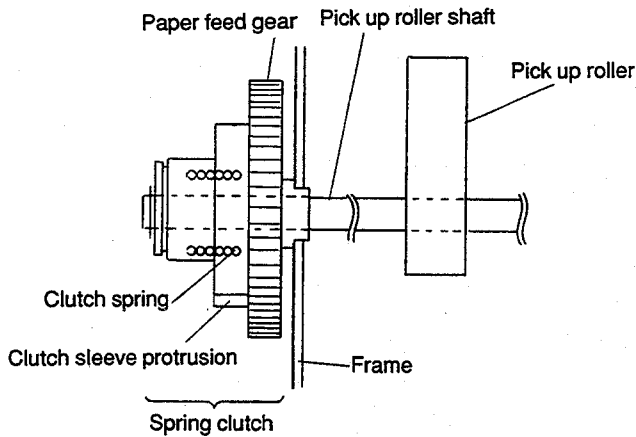


Fig. 7-4

- ③ In about 1 second after the start of the main motor, the paper feed solenoid (PFS) actuates momentarily so the paper feed latch disengages from the clutch sleeve protrusion. Then, the rotation of the paper feed gear is conveyed to the paper feed roller shaft so the pick up roller starts rotating to feed the paper.

■ Pick up roller

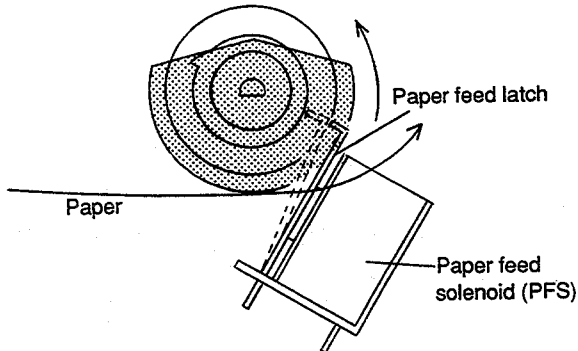


Fig. 7-5

- ④ As the pick up roller makes a full turn, the clutch sleeve protrusion is caught by the paper feed latch so that the paper feed roller A stops rotating.

■ Pick up roller

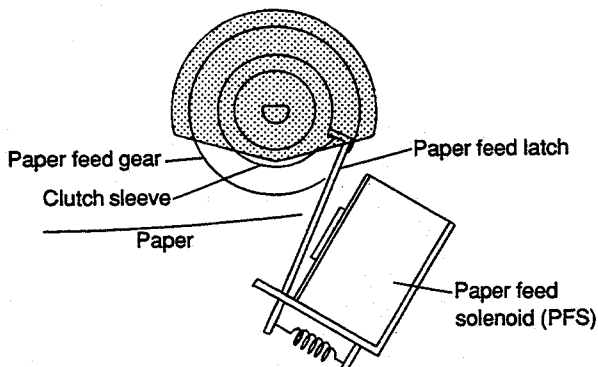


Fig. 7-6

- ⑤ The paper fed into the machine is transported to the PS roller through the paper feed roller and the paper entry sensor (PISW). Since the PS solenoid latch is engaged with the PS gear, the PS roller does not rotate and the paper is stopped at the PS roller to make synchronization with the lead edge and images on the drum. Since the paper feed roller continues to rotate, the paper lead edge is evenly pressed against the PS roller to correct a paper feed skew.

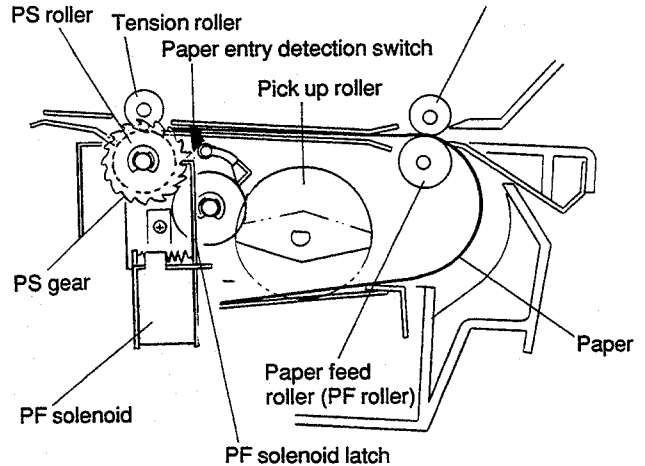


Fig. 7-7

- ⑥ Then the PS solenoid is turned on to rotate the PS roller. The paper is transported to the transfer block, where images are transferred on to the paper.

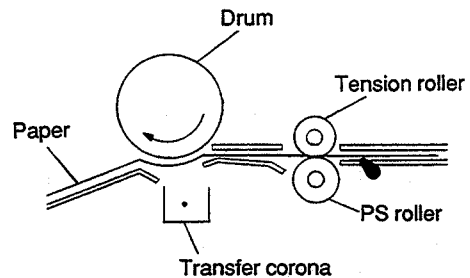


Fig. 7-8

- ⑦ The paper is electrostatically separated from the drum and transported through the fusing paper guide, the upper and lower heat rollers (fusing section), and the POUT switch (paper exit detection).

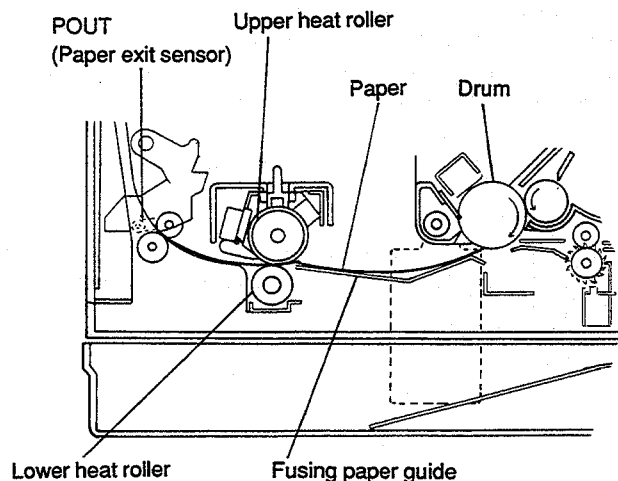


Fig. 7-9

- ⑧ After passing through the POUT, the paper is fed out to the face up tray, face up mode only. When the face up tray is open, the paper turn guide is simultaneously opened in arrow direction (A) in Fig. 7-10 and is separated from the transport roller, allowing the paper to be fed out to the face up tray.

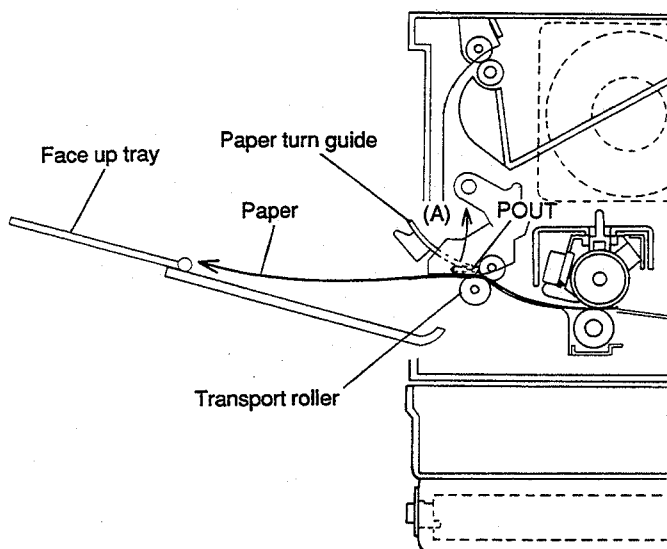


Fig. 7-10

- ⑨ In face down mode, the face up tray is closed and the paper turn guide is in contact with the transport roller. Therefore a paper is further transported along the paper turn guide and fed out to the face down tray by the paper exit roller.

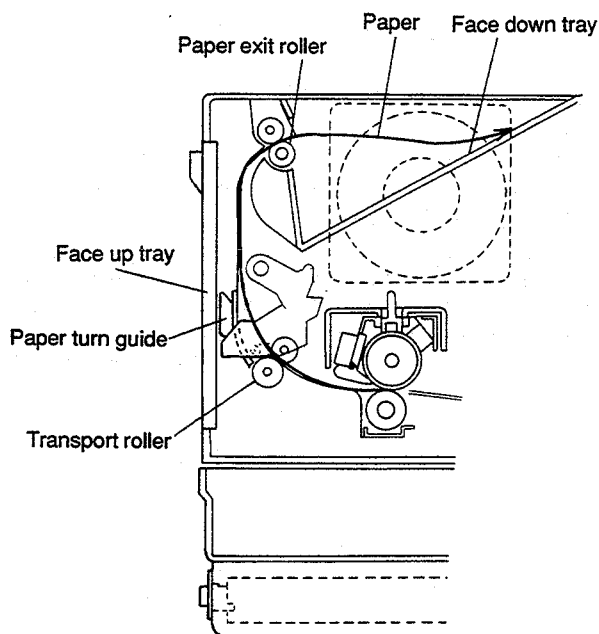


Fig. 7-11

2. Optical system

The optical system is assembled to the upper frame unit as shown in Fig. 7-12. When replacing the optical system, replace the whole unit.

After every replacement or reassembly, be sure to perform the optical system unit assembly position adjustment. [9] ADJUSTMENT.

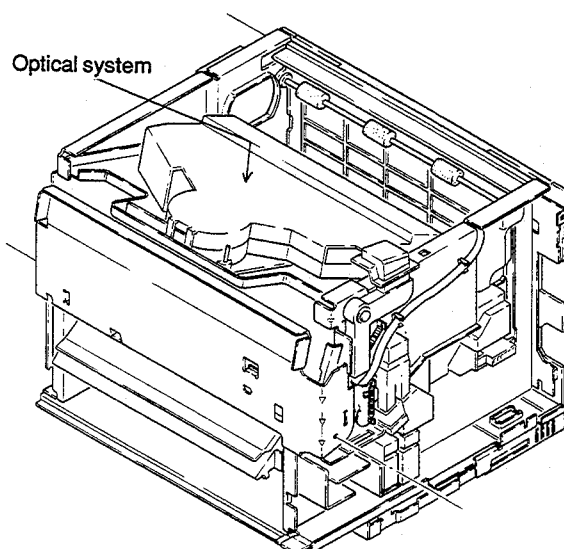


Fig. 7-12

(1) General description

A laser beam issued from the semiconductor laser diode in synchronization with the video signal is focused collaterally by means of the collimator. It is exposed to the polygonal mirror that keeps rotating at a given speed, and the laser beam scans in the main scan direction as the mirror rotates. The main scan laser beam enters the focus correction lens where it is collected and focused to the reflect mirror to reflect the beam on the drum. The point where write starts is the point where the laser beam coming out of the focus correction lens is reflected by the trigger mirror exposes the photodiode.

(2) Major components

Light source	Semiconductor laser diode (780nm wavelength) Laser output control PWB (APC circuit)
Deflector	Polygonal mirror, scan motor, control circuit board
Optics collimator	Focus correction lens, Reflect mirror, Collimator lens
Beam point detector	Pin diode Detect circuit board, Trigger mirror
Panels	Plastic molding housing and sealing cover

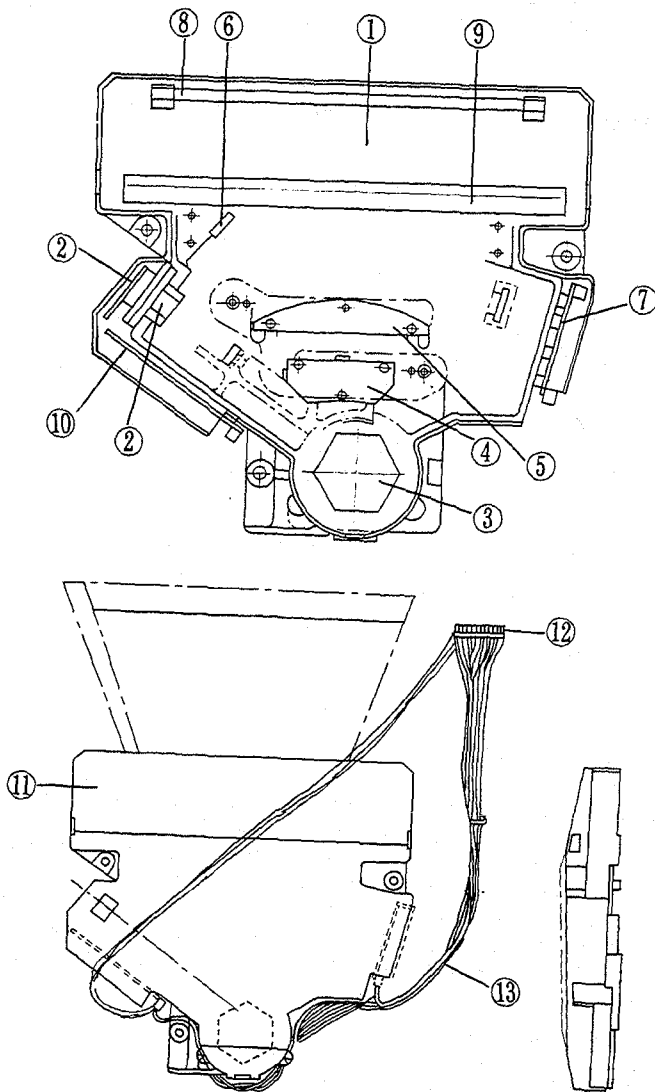
(3) Optical system block diagram

Fig. 7-13

NOTE: Dont remove the optical system cover.

1. Plastic molding
2. Semiconductor laser diode and collimator lens
3. Polygonal mirror and scan motor
4. Focus correction lens A
5. Focus correction lens B
6. Trigger mirror
7. PIN diode and detect circuit board
8. First reflect mirror
9. Second reflect mirror
10. APC circuit board
11. Sealing cover
12. Connectors
13. Leads

3. FUSER UNIT**1. General description**

(Cross sectional view)

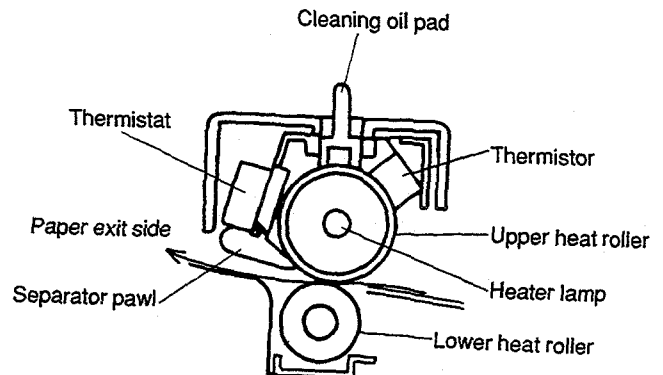


Fig. 7-14

(Top view)

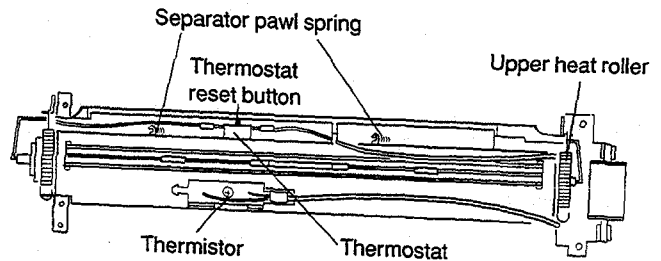


Fig. 7-15

(1) Heat roller

A teflon roller is used for the upper heat roller and a silicon rubber roller is used for the lower heat roller for better toner fusing performance and paper separation.

When the clamshell is opened, as shown in Fig. 7-16 the lower heat roller holding angle is pulled in direction (A) by the spring and the lower heat roller moves down in direction (B). In this machine, when the clamshell is opened, the upper and the lower heat rollers are automatically separated for paper removal in the case of a paper jam.

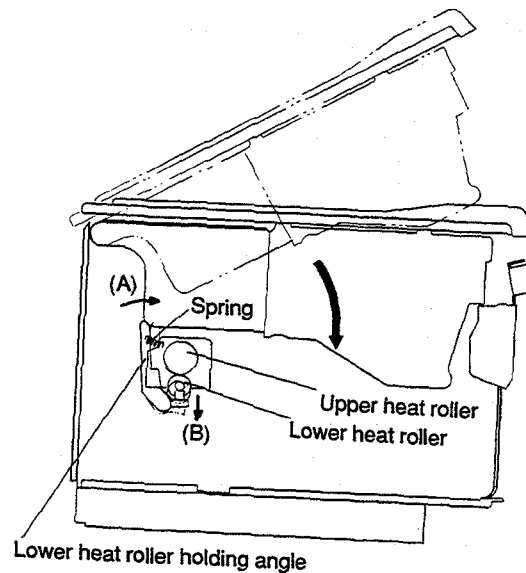


Fig. 7-16

(2) Cleaning oil pad

For this machine, The cleaning oil pad can be replaced easily.

The cleaning oil pad has the following function.

- A small quantity of silicon oil is applied to the upper heat roller to prevent separation pawl wear, remove the lower heat roller dirt, and prevent adhesion of dirt to the upper heat roller.

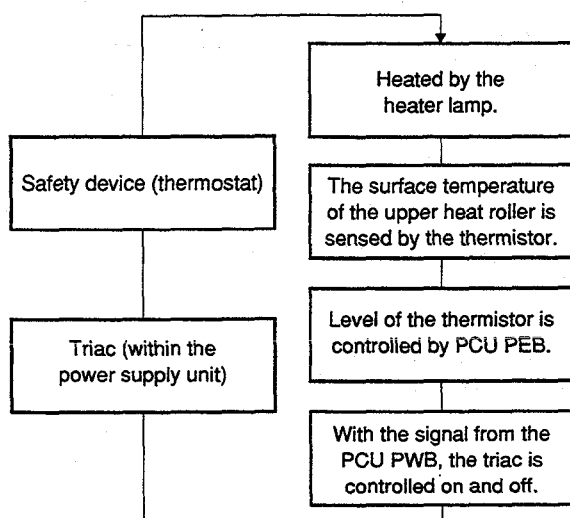
(3) Separator pawl

Two separator pawls are used on the upper heat roller. The separator pawl is teflon coated to reduce friction with the roller.

(4) Thermal control

- ① The heater lamp, thermistor, PCU PWB, DC power supply PWB, and triac within the power supply unit are used to control the temperature in the fuser unit.

To prevent excessive high temperature in the fuser unit, a thermostat is used for safety purposes.



Temperature control flow chart

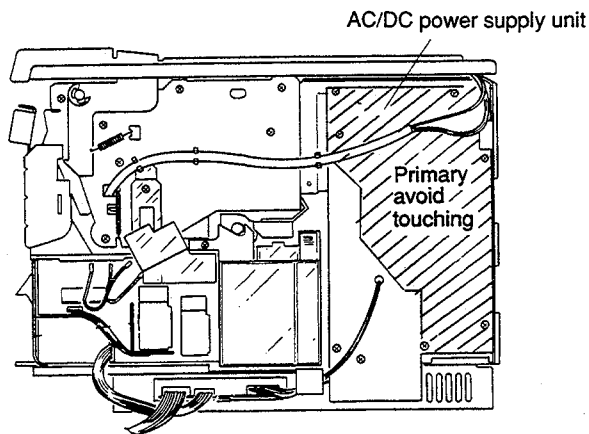
- ② The surface temperature of the upper heat roller is set to 165°C (175°C manual feed).
- ③ The self-check function comes active when one of the following malfunctions is met, and an error is displayed.
 - a. When the heat roller surface temperature rose above 230 to 250°C, the status "SERVICE (C4)" is displayed.
 - b. When the heat roller surface temperature dropped below 90 to 100°C during the print cycle, the status "SERVICE (C5)" is displayed.
 - c. When the thermistor opened, the status "SERVICE (C6)" is displayed.
 - d. When the thermostat contacts are open due to irregularly high heat roller temperature, the status "SERVICE (C4)" is displayed (*1).

*1: When the thermostat contacts are open, the reset button on the thermostat must be pushed to reset it, as the contacts do not restore automatically.

[8] DISASSEMBLY AND REASSEMBLY

CAUTION FOR SERVICING

NEVER TOUCH THE AC/DC POWER PWB WITH THE AC CORD CONNECTED TO THE POWER OUTLET. IT MAY CAUSE A DANGEROUS ELECTRIC SHOCK.



This section describes the disassembly and assembly procedure.

The descriptions include the following:

- A description is given for disassembly, re-assembly should be done in the reverse sequence.

Where specific caution is required, warnings are given.

- Disassembly and re-assembly items include the units and/or parts which may require replacement during maintenance level. The following description shows these units or parts.
- Describes the screws whose locations may be difficult to find, units or parts which must be removed in a specified order or require a special technique. The following description does not include the units or parts for which the re-assembly procedure is obvious.
- The cable clamp etc. are excluded from the description unless it requires special attention. Location of such items must be checked before its removal from the machine.
- Positions to be lubricated, see figures and descriptions.
- The optical system unit must be replaced as a whole unit without disassembly.

8-1. External frame

- Push the opener to lift the upper frame unit.
- Remove two screws (B1) and remove left cabinet ①.
- Remove two screws (B2) and remove right cabinet ②.
- Disconnect connector (CN1) from the operation panel ③ connected to the PCU PWB.

- Remove two screws (B3) and two screws (B4), and remove front cabinet ④.

- Remove four screws (B5).

- Slide face down tray ⑤ in direction of arrow (A), then lift it in direction of arrow (B) to remove.

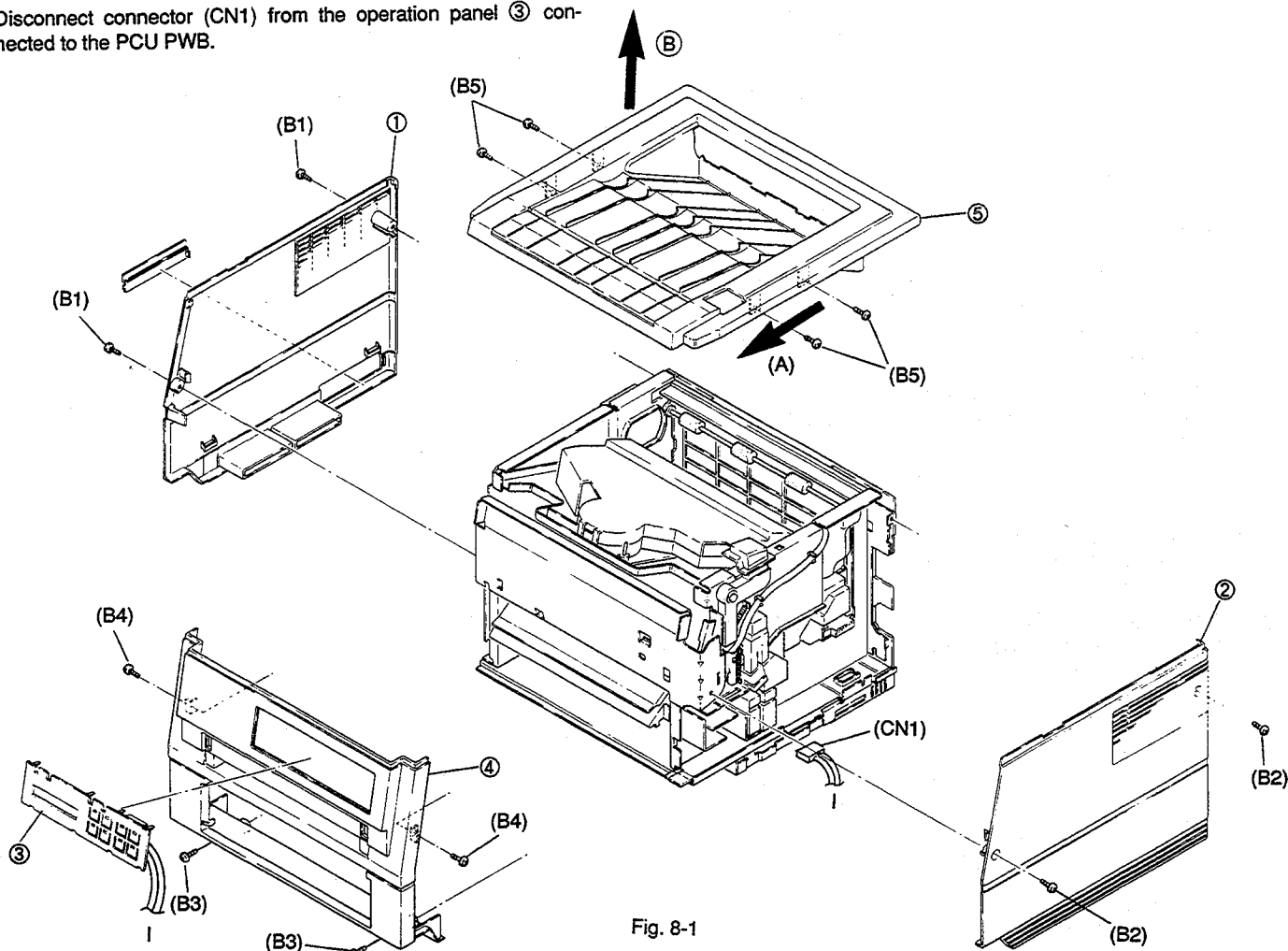


Fig. 8-1

8-2. AC/DC1 power unit

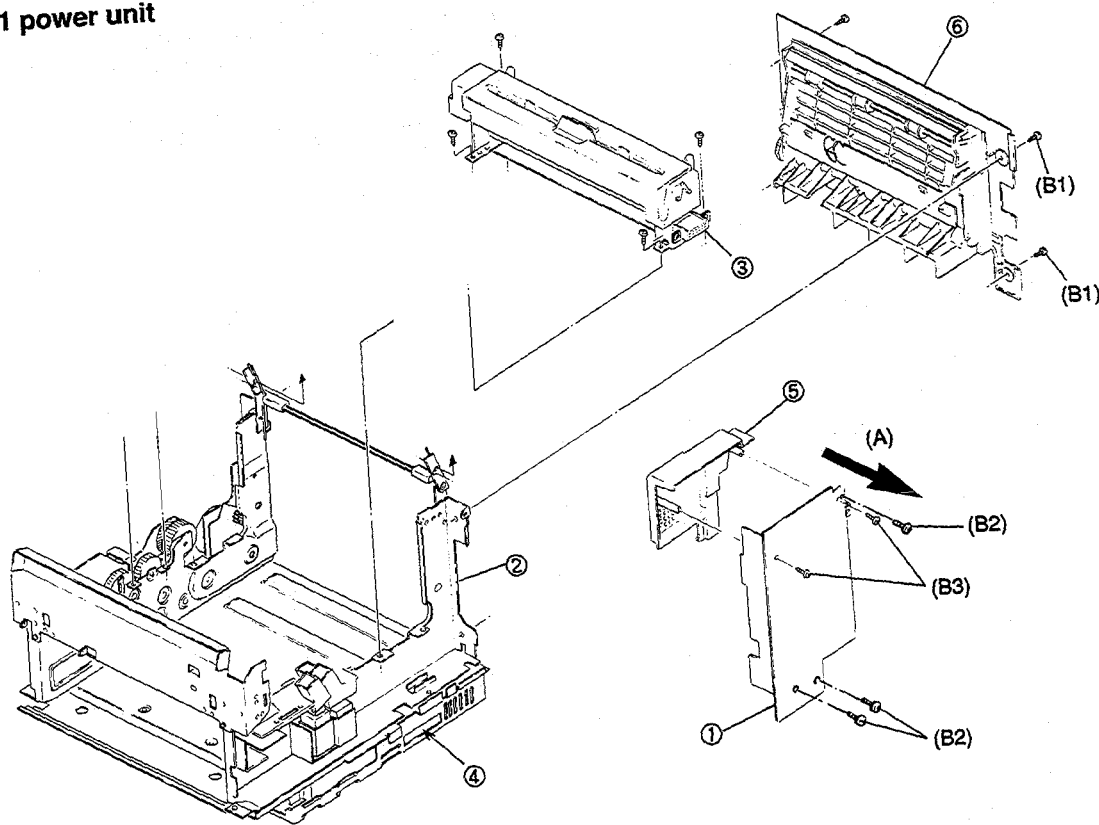


Fig. 8-3

- Remove the left cabinet. (See 8-1. External frame.)
- The AC/DC power unit is fixed to the rear cabinet ⑥ and frame ② with two screws (B1). First remove the two screws (B1).
- Remove three screws (B2).
- In AC/DC power unit ①, fuser unit connector ③ and DC2 PWB connector ④ are directly connected with AC/DC power unit ① connector, remove the connector by pulling it straight in direction of the arrow (A).
- Remove two screws (B3) to remove AC/DC power unit cover ⑤ from AC/DC power unit ①.

Note for assembly

- When reassembling AC/DC power unit ①, reassemble it from DC2 PWB connector ④ by fitting it with the fuser unit connector ③ and DC2 PWB connector ④.

8-3. Upper frame unit

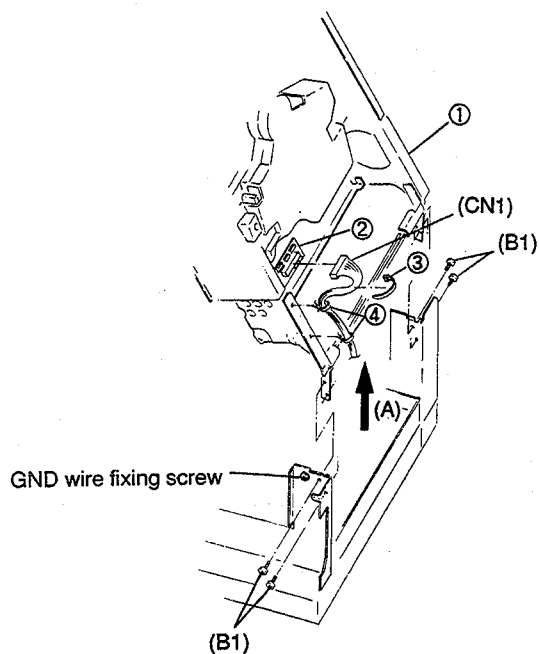


Fig. 8-4

- a. Push the opener to lift the upper frame ①.
- b. Remove the left and right cabinets. (8-1. External frame.)
- c. Remove the face down tray. (8-1. External frame.)
- d. Remove the AC/DC power unit. (See 8-2. AC/DC power unit.)
- e. Remove connector (CN1) from connector PWB ②.
(Connector (CN1) is connected to the PCU PWB on the lower frame.) Cut binding band ③.
- f. Remove two wire holders ④ as shown below:
 - Hold the lower side knob with pliers and pull the holder upward to remove.

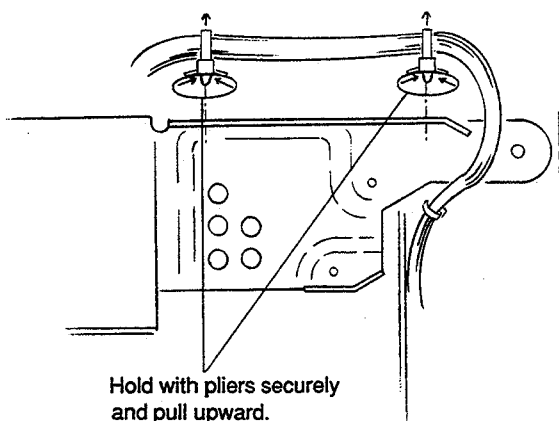


Fig. 8-5

- g. Remove the GND wire fixing screw.
- h. Remove four screws (B1) and pull upper frame ① upward in direction of arrow (A).

Note for reassembly

- Insert the upper frame into the lower frame so that the upper frame angle and the lower frame rear side are in parallel as shown in Fig. 8-6.
Adjust flange (A) of upper frame angle ① so that it is engaged with holding port (B) of the lower frame.

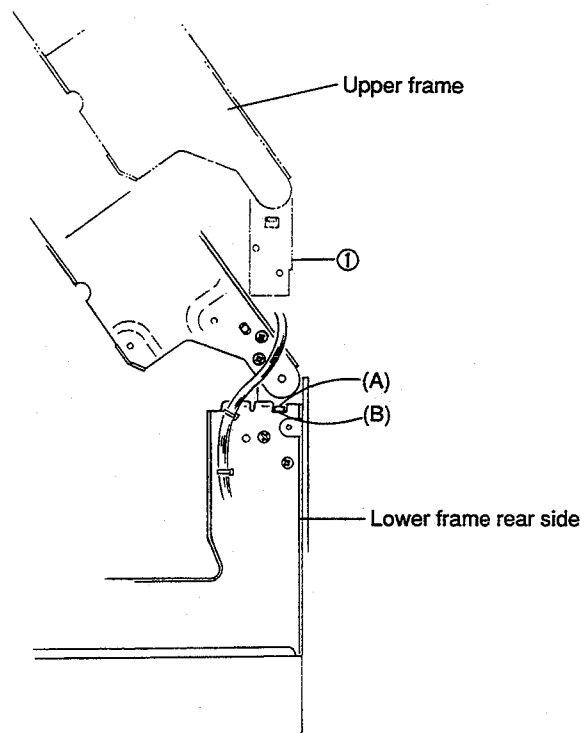


Fig. 8-6

8-3-1. Optical system unit

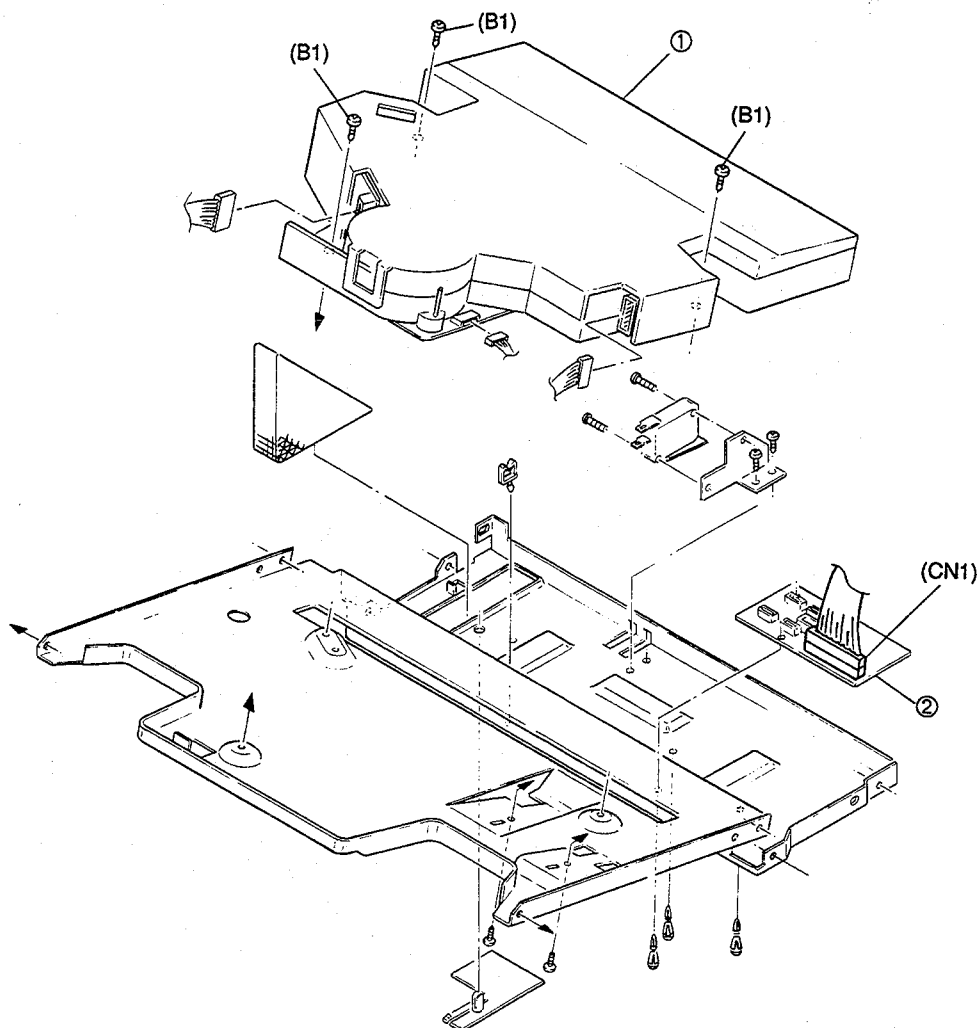


Fig. 8-7

- Push the opener to lift the upper frame unit.
- Remove the face down tray. (8-1. External frame.)
- Remove connector (CN1) (which comes from the optical system unit) from connector PWB ②.
- Remove three screws (B1) and remove optical system unit ① from the upper frame unit.

Note for reassembly

- After reassembling optical system unit ①, perform the "9-2. optical system unit installing position adjustment."

8-3-2. Cooling fan motor

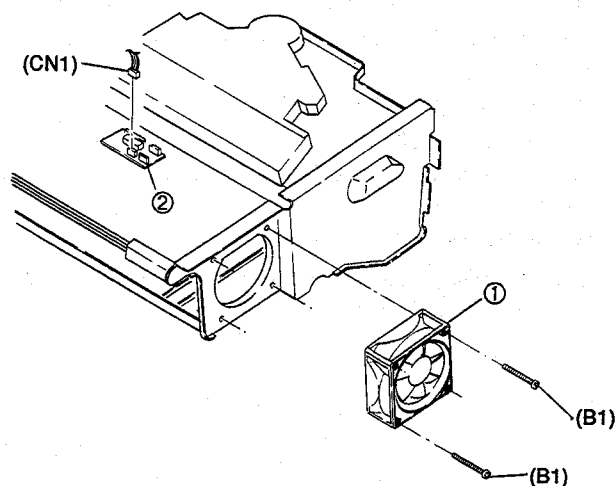


Fig. 8-8

- Remove the left cabinet. (8-1. External frame.)
- Remove the face down tray. (8-1. External frame.)
- Remove connector (CN1) (which comes from cooling fan motor ①) from connector PWB ②.
- Remove two screws (B1) and remove cooling fan motor ①.

8-4. Lock unit

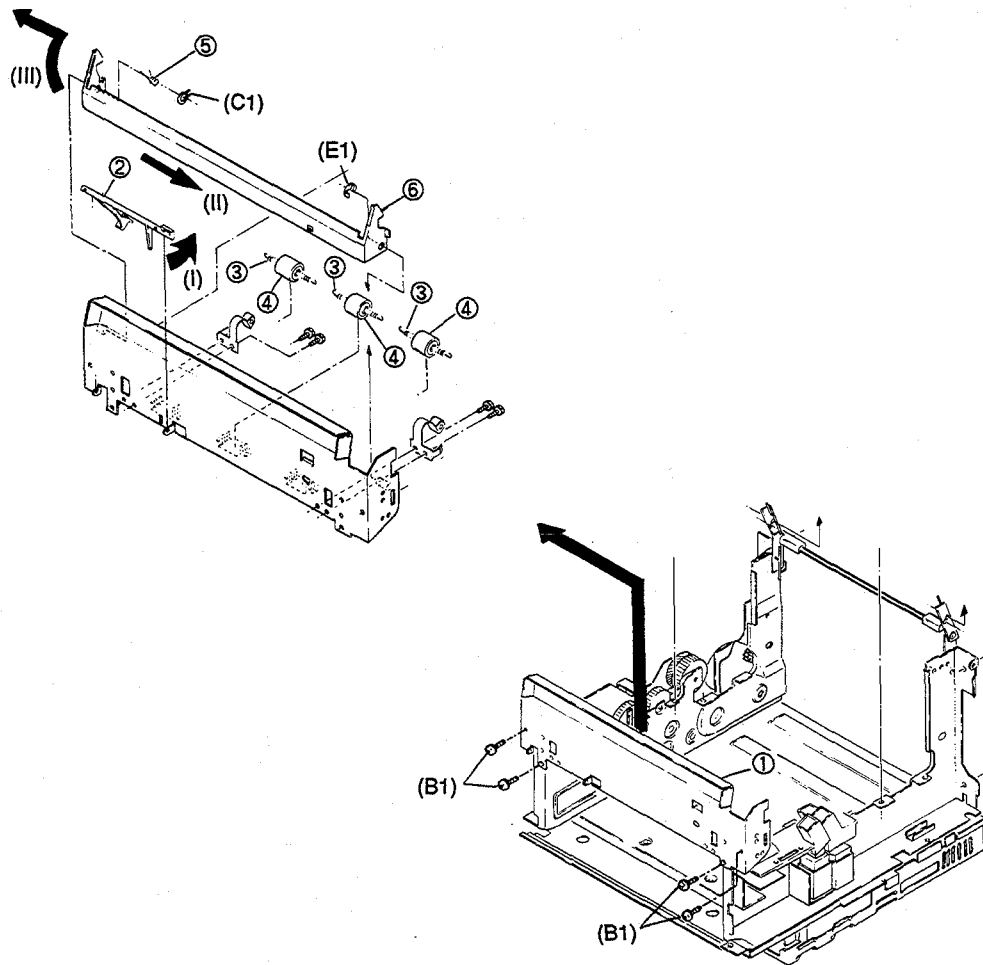


Fig. 8-9

- a. Push the opener to lift the upper frame unit.
- b. Remove the left and right cabinets. (8-1. External frame.)
- c. Remove the front cabinet. (8-1. External frame.)
- d. Remove four screws (B1).
- e. Push HFIN switch ② in direction of arrow (I), remove lock unit ①.
- f. Remove spring ③ and remove PS follower roller ④. (Remove the three in the same manner.)
- g. Remove C ring (C1) and E ring (E1).
- h. Remove lock spring ⑤.
- i. Pull lock arm (6) in direction of arrow (II), and remove it in direction of arrow (III).
- j. Remove HFIN switch ② as follows:
 - ① Turn in direction of arrow (I) in Fig. 8-10 to extend pawl (II) which is hung on the plate.

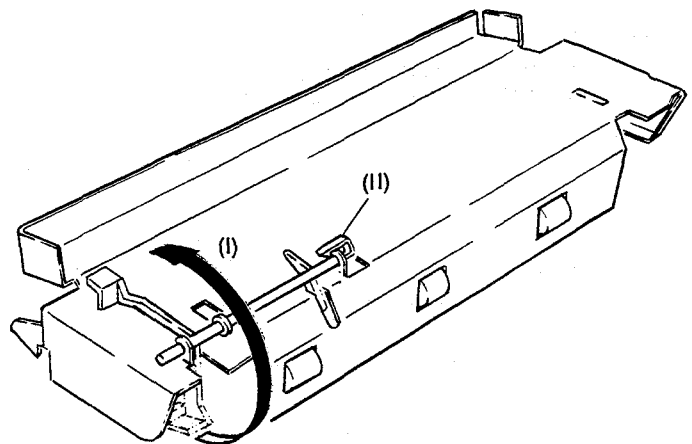


Fig. 8-10

- ② Pull in direction of arrow (III) and fit the cut notch of the HFIN switch with removing port (IV) of the plate and remove it in direction of arrow (V).

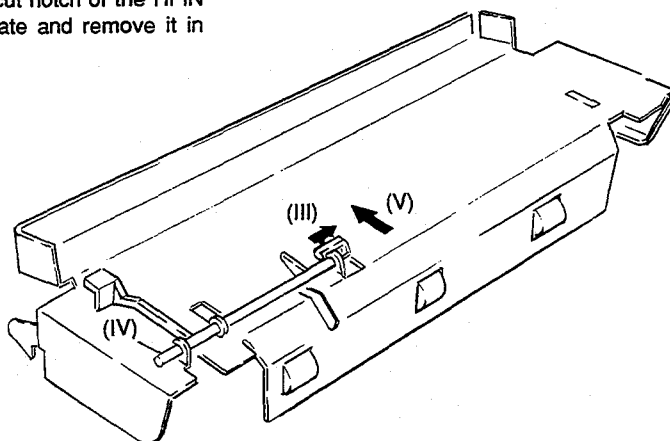


Fig. 8-11

8-5. Paper feed unit

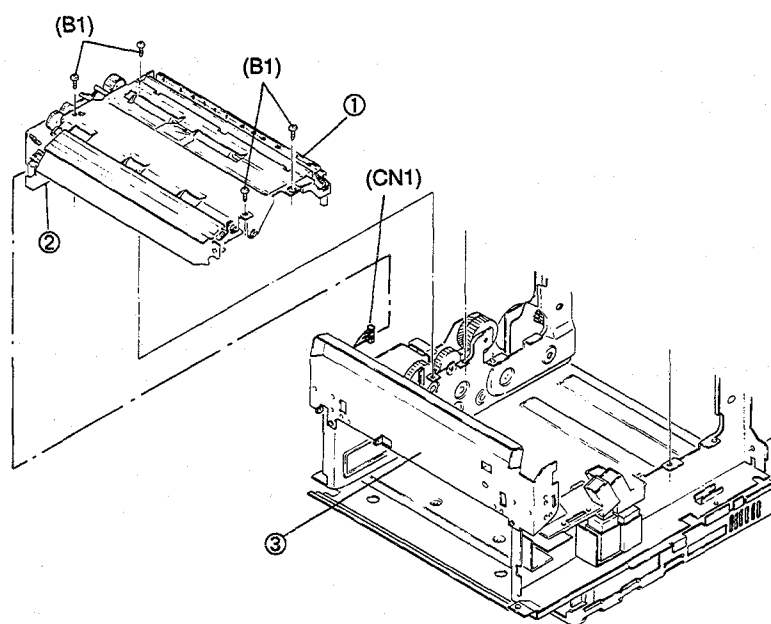


Fig. 8-12

- a. Push the opener to lift the upper frame unit.
- b. Remove the left and right cabinets. (8-1. External frame.)
- c. Remove the front cabinet. (8-1. External frame.)
- d. Remove lock unit ③. (See 8-4. Lock unit.)
- e. Remove connector (CN1) from solenoid PWB ②.
- f. Remove four screws (B1) and remove paper feed unit ①.

8-5-1. Transfer corona

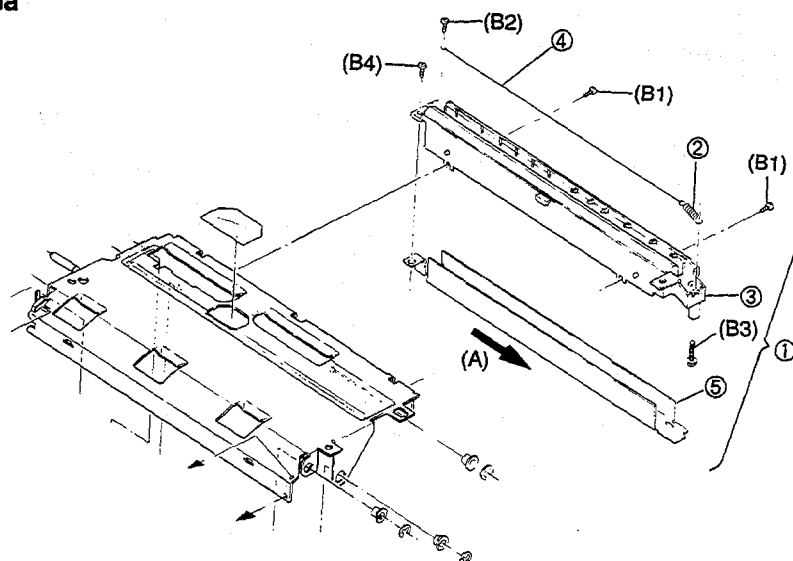


Fig. 8-13

- Remove the paper feed unit. (See 8-5. Paper feed unit.)
- Remove two screws (B1) and remove transfer corona ①.
- Remove screw (B2).
- Remove spring ② from screw (B3) which is secured to plate ③, and remove corona wire ④.
- Remove screw (B4) and pull plate ⑤ in direction of arrow (A) to remove it downward.

Note for reassembly

- Corona wire stretching

Note: When stretching corona wire, wire cutters and tweezers are required.

- Wind corona wire around the spring as shown below:

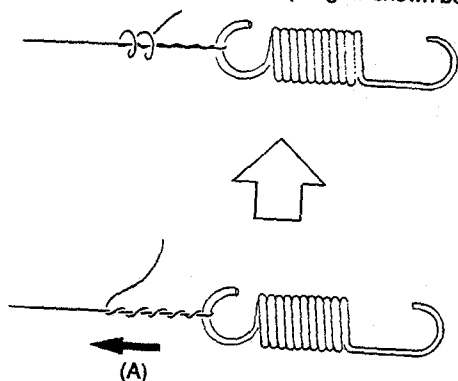


Fig. 8-14

As shown in Fig. 8-14, wind corona wire five turns in direction of arrow (A), then wind two turns in the opposite direction of arrow (A).

- Use tweezers to hang spring ① on screw (B1).

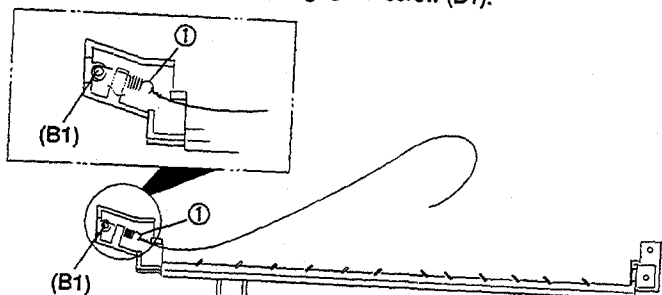


Fig. 8-15

- Temporarily tighten screw (B1) and wind corona wire ① one turn as shown in Fig. 8-16.

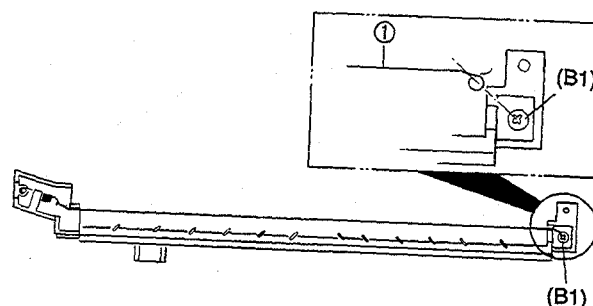


Fig. 8-16

- Pull the corona wire until the length of spring ① becomes 9.5 ± 0.5 mm as shown in Fig. 8-17. Then tighten screw (B1).

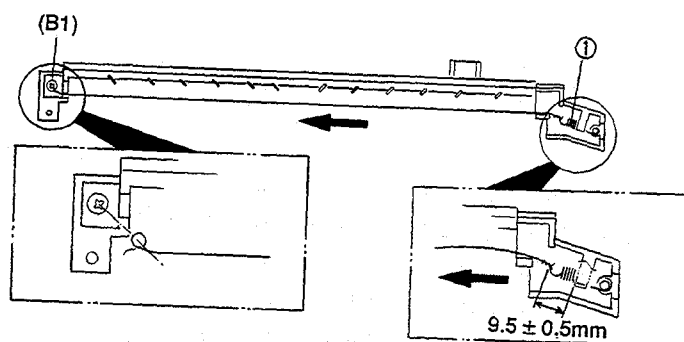


Fig. 8-17

- Cut and trim the wire with wire cutters.

8-5-2. Solenoid PWB

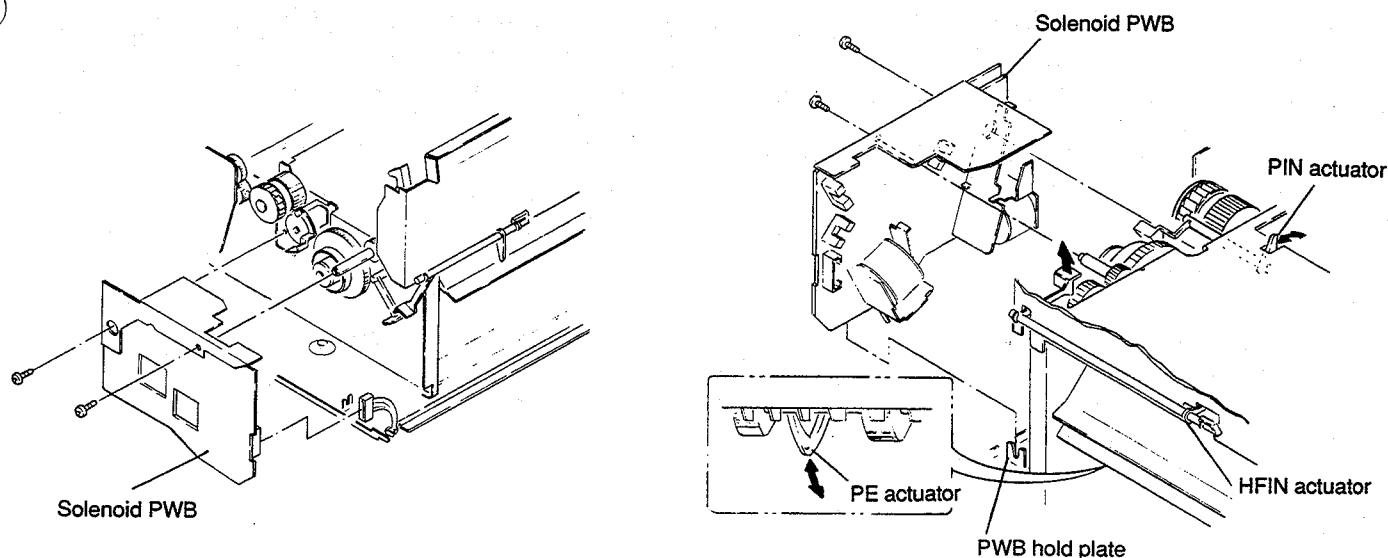


Fig. 8-18

Note for reassembly

When assembling, carefully fit the actuators to the sensors so that the actuators move smoothly.

- Push the opener to lift the upper frame unit.
- Remove the left cabinet.
- Remove two screws and remove solenoid PWB.

8-5-3. Pick up roller, PF roller, PS roller

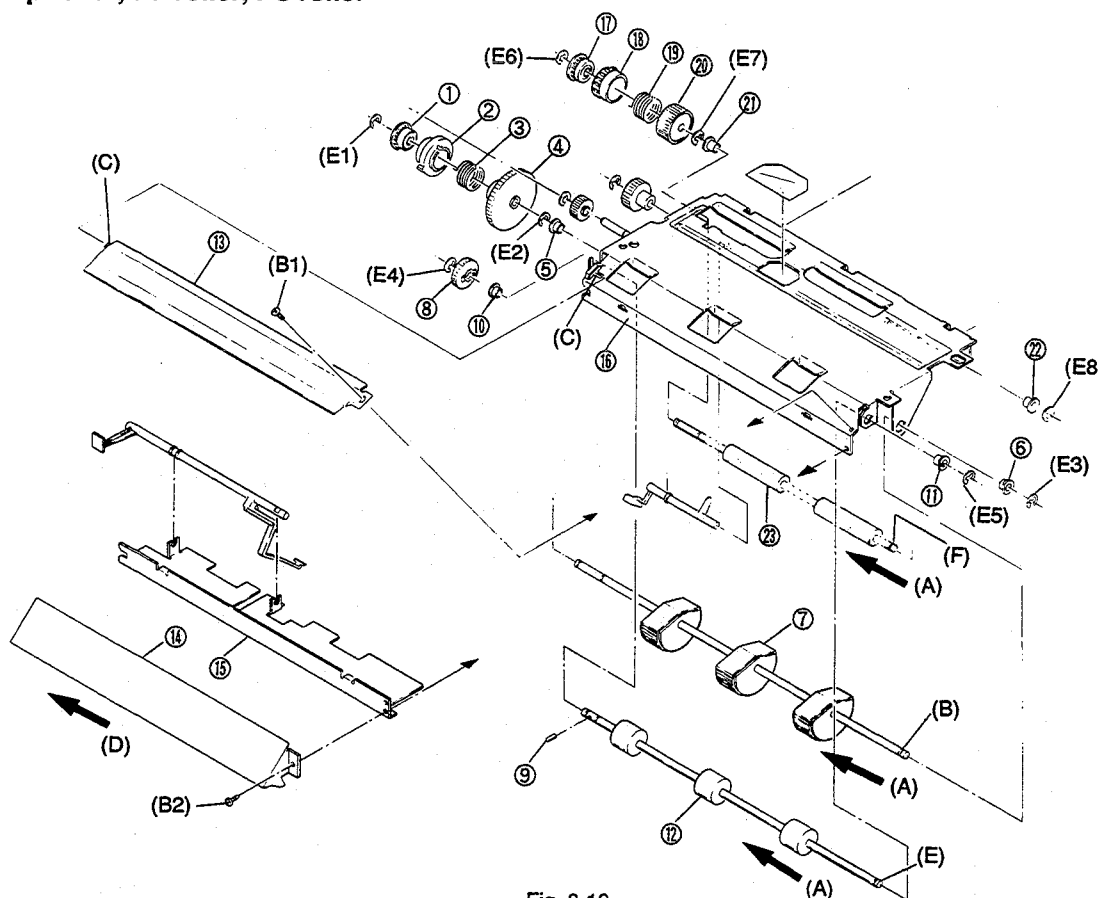


Fig. 8-19

A. Pick up roller

- Remove paper feed unit. (See 8-5. Paper feed unit.)
- Remove the solenoid PWB.
- Remove E ring (E1).
- Remove clutch boss ①, clutch sleeve ②, clutch spring ③, and paper feed drive gear ④.
- Remove E ring (E2) and remove bearing ⑤.
- Remove E ring (E3) and remove bearing ⑥.
- Push pick up roller ⑦ in direction of arrow (A) and remove section (B) from the plate.
- Remove pick up roller ⑦ in the opposite direction of arrow (A).

B. PF roller

- Remove paper feed unit. (See 8-5. Paper feed unit.)
- Remove the solenoid PWB. (See 8-5-2. Solenoid PWB.)
- Remove screw (B1). U-turn guide B ⑬ from section (C) and remove it from transport plate ⑮.
- Remove screw (B2), pull U-turn guide ⑭ in direction of arrow (D), and remove it together with plate ⑮ from transport plate ⑮.
- Remove E ring (E4).
- Remove PF gear ⑧ and remove pin ⑨.
- Remove bearing ⑩.
- Remove E ring (E5) and remove bearing ⑪.
- Push PF roller ⑫ in direction of arrow (A) and separate section (E) from the plate.
- Remove PF roller ⑫ in the opposite direction of arrow (A).

C. PS roller

- Remove the paper feed unit. (See 8-5. Paper fed unit.)
- Remove the solenoid PWB. (See 8-5-2. Solenoid PWB.)
- Remove E ring (E6), and remove clutch boss ⑰, PS clutch gear ⑱, clutch spring ⑲ and PS gear ⑳.
- Remove E ring (E7) and remove bearing ㉑.
- Remove E ring (E8) and remove bearing ㉒.
- Pull PS roller ㉓ in direction of arrow (A), and separate section (F) from the plate.
- Remove PS roller ㉓ in the opposite direction of arrow (A).

8-6. Fuser unit

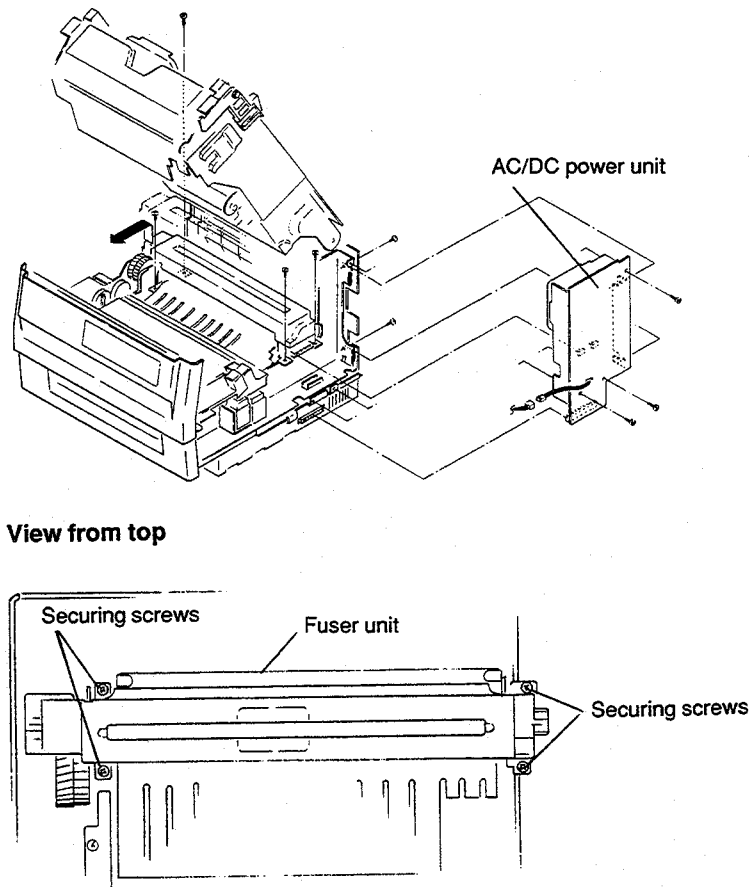
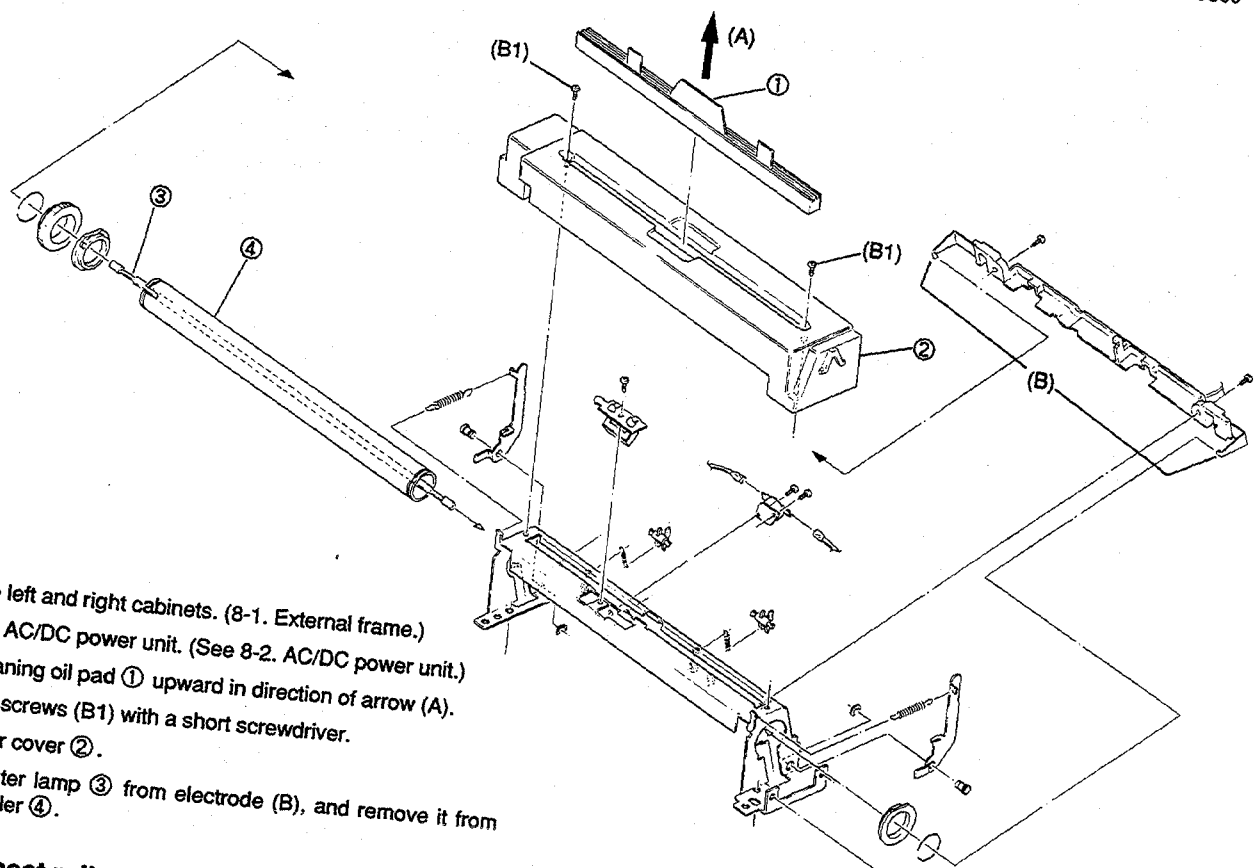


Fig. 8-20

- Remove the FD tray and the right cabinet.
- Remove the AC/DC power unit.
- Open the face up tray filter.
- Open the paper turn unit.
- Remove the fuser unit fixing screws (4 pcs.) and remove the fuser unit in the arrow direction.

8-6-1. Heater lamp

JX-9500



- Remove the left and right cabinets. (8-1. External frame.)
- Remove the AC/DC power unit. (See 8-2. AC/DC power unit.)
- Remove cleaning oil pad ① upward in direction of arrow (A).
- Remove two screws (B1) with a short screwdriver.
- Remove fuser cover ②.
- Separate heater lamp ③ from electrode (B), and remove it from upper heat roller ④.

Fig. 8-21

8-6-2. Upper heat roller, lower heat roller

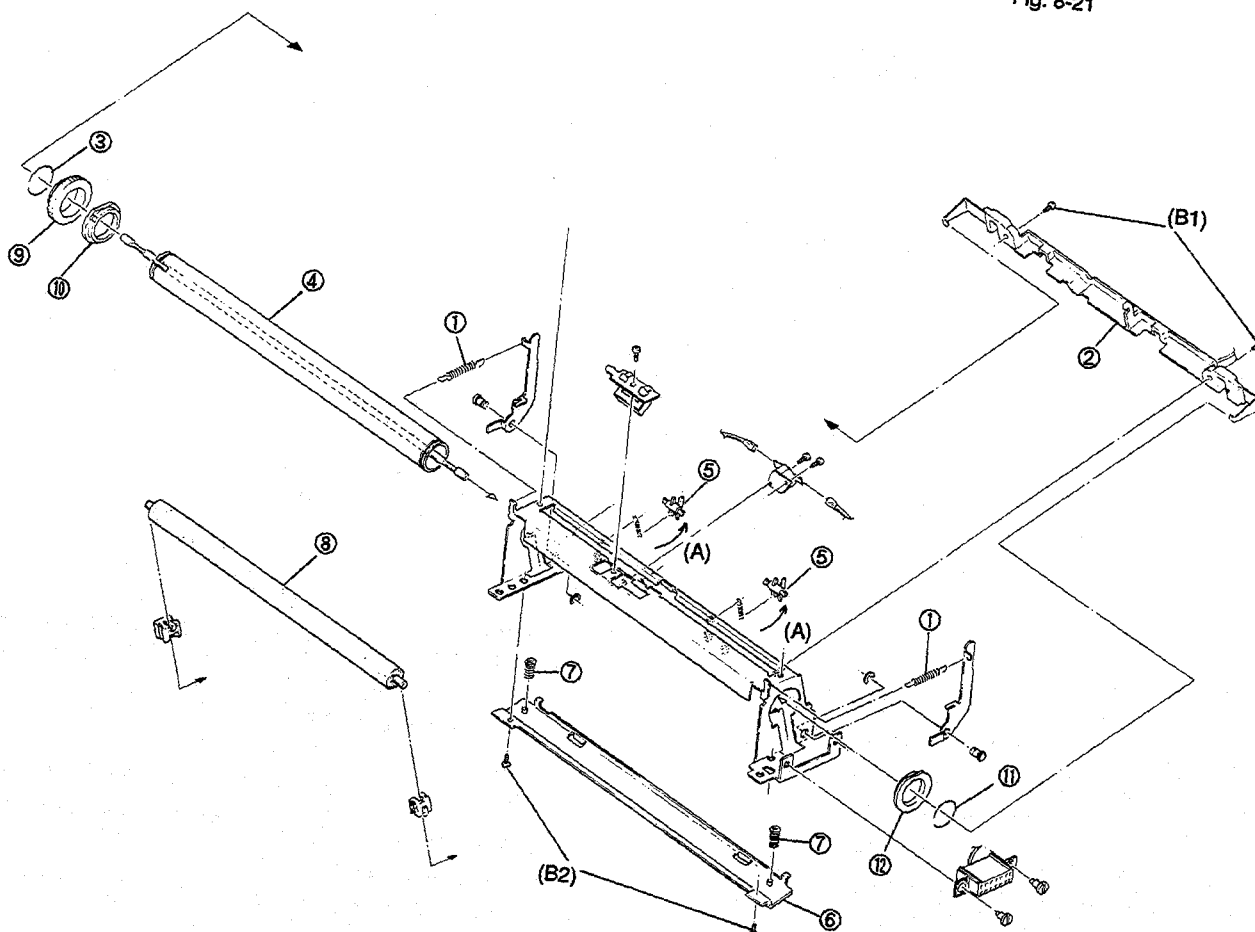


Fig. 8-22

A. Upper heat roller

- a. Remove the left and right cabinets. (8-1. External frame.)
- b. Remove the AC/DC power unit. (See 8-2. AC/DC power unit.)
- c. Remove the upper frame unit. (See 8-3. Upper frame unit.)
- d. Remove the fuser unit. (See 8-6. Fuser unit.)
- e. Remove the heater lamp. (See 8-6-1. Heater lamp.)
- f. Remove pressure relief spring ①.
- g. Remove two screws (B1) and remove terminal holder ②.
- h. Remove stop ring ③.
- i. Remove gear ⑨ and flange ⑩ from upper heat roller ④.
- j. Remove stop ring ⑪ and remove flange ⑫ from upper heat roller ④.
- k. Remove upper heat roller ④.

Note: When removing upper heat roller ④, put separation pawl ⑤ upward (direction A) to protect upper heat roller ④ from scratches.

B. Lower heat roller

- a. Remove the left and right cabinets. (8-1. External frame.)
- b. Remove the AC/DC power unit. (See 8-2. AC/DC power unit.)
- c. Remove the upper frame unit. (See 8-3. Upper frame unit.)
- d. Remove the fuser unit. (See 8-6. Fuser unit.)
- e. Remove two screws (B1) and remove under-plate ⑥.

Note: Be careful that under-plate ⑥ will pop up because of pressure spring ⑦.

- f. Remove lower heat roller ⑧.

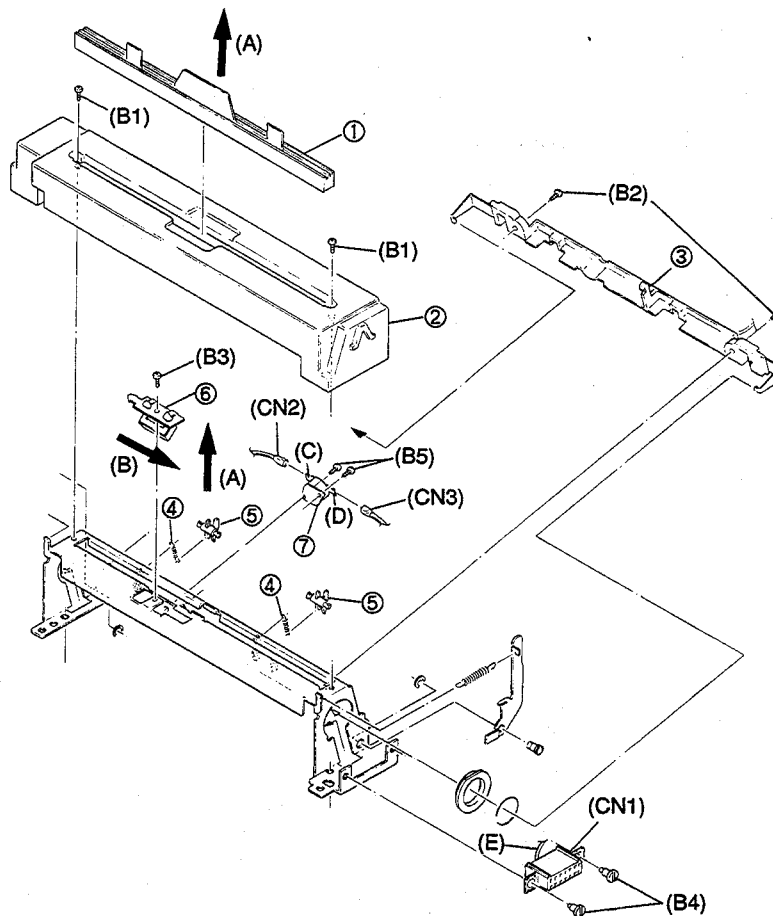
8-6-3. Separation pawl, thermistor, thermostat

Fig. 8-23

A. Separation pawl

- a. Remove the left and right cabinets. (8-1. External frame.)
- b. Remove the AC/DC power unit. (See 8-2. AC/DC power unit.)
- c. Remove the upper frame unit. (See 8-3. Upper frame unit.)
- d. Remove the fuser unit. (See 8-6. Fuser unit.)
- e. Remove cleaning oil pad ① upward in direction of arrow (A).
- f. Remove two screws (B1) and remove fuser cover ②.
- g. Remove two screws (B2) and remove terminal holder ③.
- h. Remove spring ④ and remove separation pawl ⑤.

B. Thermistor

- a. Remove the left and right cabinets. (8-1. External frame.)
- b. Remove the AC/DC power unit. (See 8-2. AC/DC power unit.)
- c. Remove the upper frame unit. (See 8-3. Upper frame unit.)
- d. Remove the fuser unit. (See 8-6. Fuser unit.)
- e. Remove cleaning oil pad ① upward in direction of arrow (A).
- f. Remove two screws (B1) and remove fuser cover ②.
- g. Remove a screw (B3).
- h. Slide thermistor ⑥ in direction of arrow (B) and pull it out upward in direction of arrow (A).

- i. Remove two screws (B4) and remove fuser connector (CN1).
- j. Use a thin, small pin to remove terminal (E) (which is connected with thermistor ⑥) from fuser connector (CN1).

C. Thermostat

- a. Remove the left and right cabinets. (8-1. External frame.)
- b. Remove the AC/DC power unit. (See 8-2. AC/DC power unit.)
- c. Remove the upper frame unit. (See 8-3. Upper frame unit.)
- d. Remove the fuser unit. (See 8-6. Fuser unit.)

- e. Remove cleaning oil pad ① upward in direction of arrow (A).
- f. Remove two screws (B1) and remove fuser cover ②.
- g. Remove two screws (B2) and remove terminal holder ③.
- h. Remove connectors (CN2) and (CN3) from the left side (C) and right side (D) of thermostat ⑦ terminal.
- i. Remove two screws (B5) and remove thermostat ⑦.

8-7. Separation unit

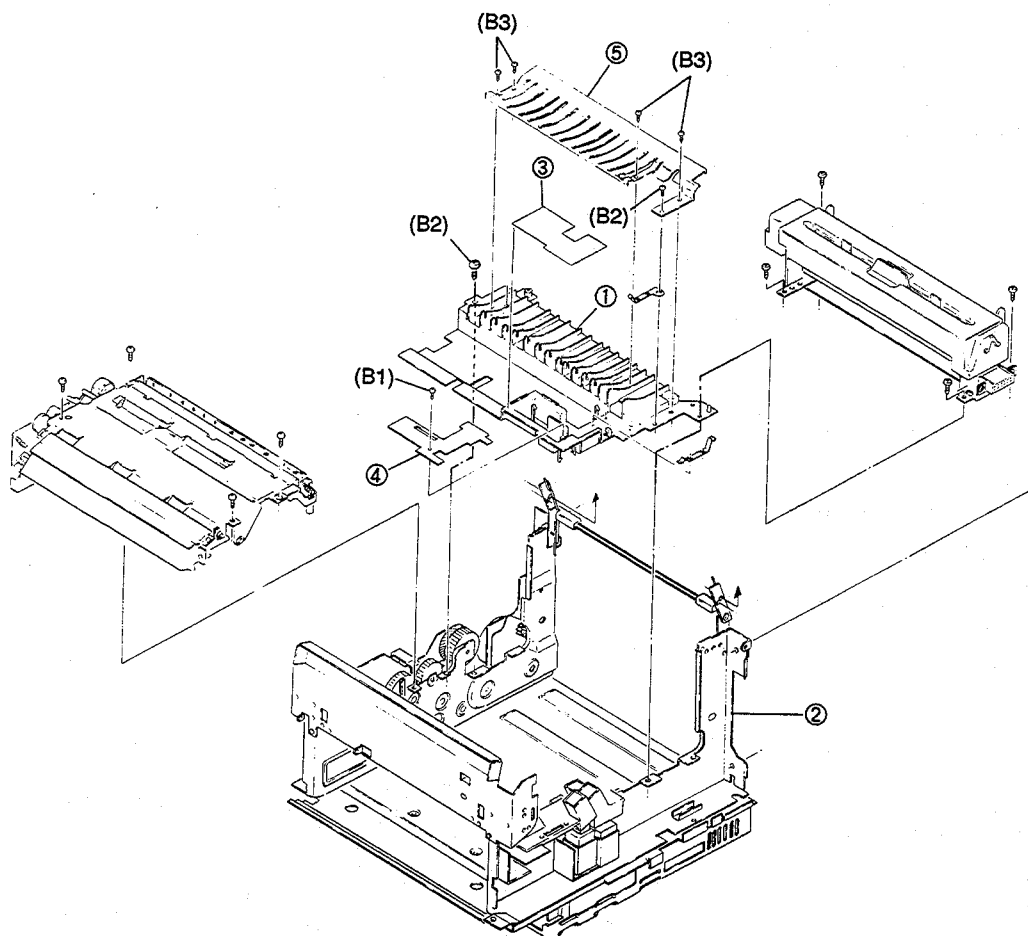


Fig. 8-24

- a. Remove the left and right cabinets. (8-1. External frame.)
 - b. Remove the AC/DC power unit. (See 8-2. AC/DC power unit.)
 - c. Remove the upper frame unit. (See 8-3. Upper frame unit.)
 - d. Remove paper feed unit. (See 8-5. Paper feed unit.)
 - e. Remove fuser unit. (See 8-6. Fuser unit.)
 - f. Remove high voltage mylar sheet ③.
- Note: High voltage mylar sheet ③ is attached with double-side adhesive tape.
- g. Remove screw (B1) and remove high voltage turning PWB ④ from separation unit ①.
 - h. Remove two screws (B2).
 - i. Lift separation unit ① to remove from lower frame ②.
 - j. By removing four screws (B3), plate ⑤ can be removed from separation unit ①.

8-8. Paper exit unit

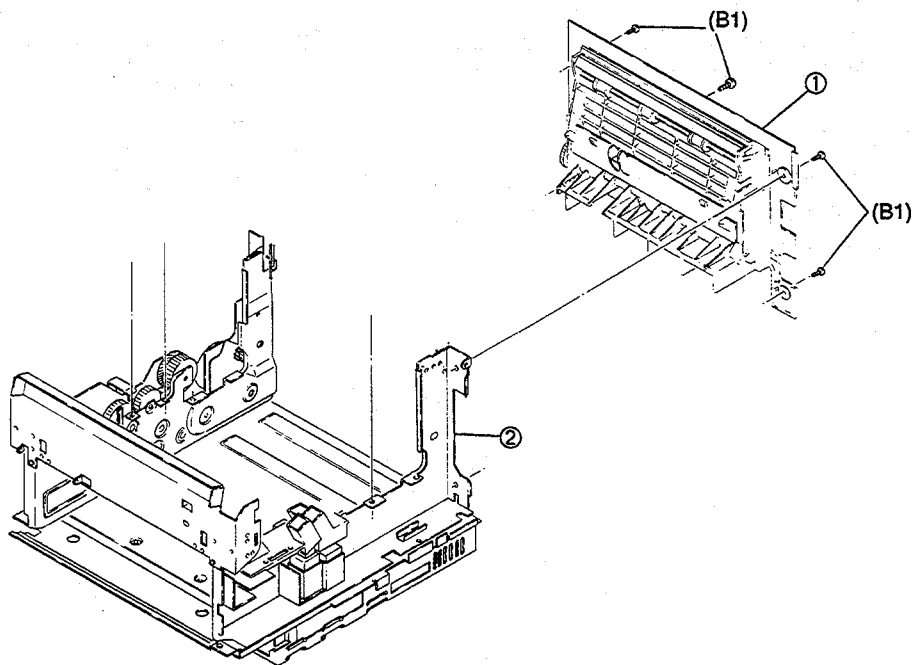


Fig. 8-25

- Remove the upper frame unit. (See 8-3. Upper frame unit.)
- Remove four screws (B1).
- Remove paper exit unit ① from lower frame ②.
- Slightly move the face up tray and remove it from the paper exit unit as shown in Fig. 8-2b.
The extension tray can be removed from the face up tray by slightly moving it as well.
In either case, it is not required to remove the paper exit unit from the body.

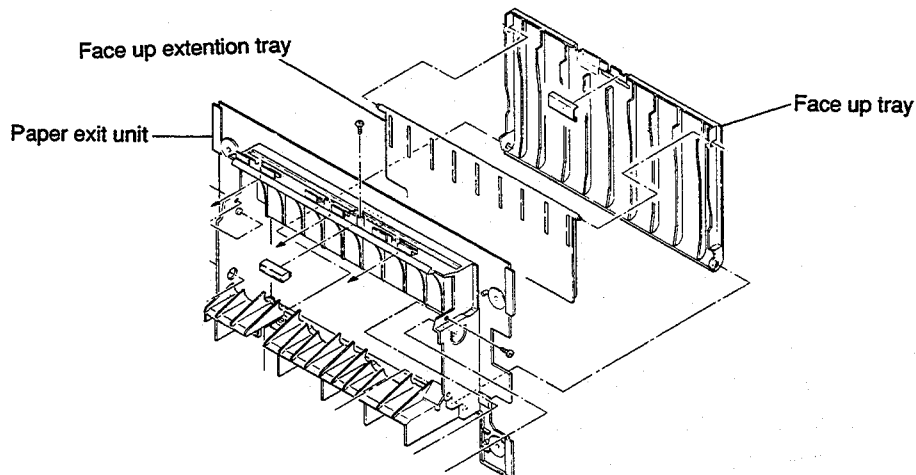


Fig. 8-26

8-8-1. Paper exit detection switch

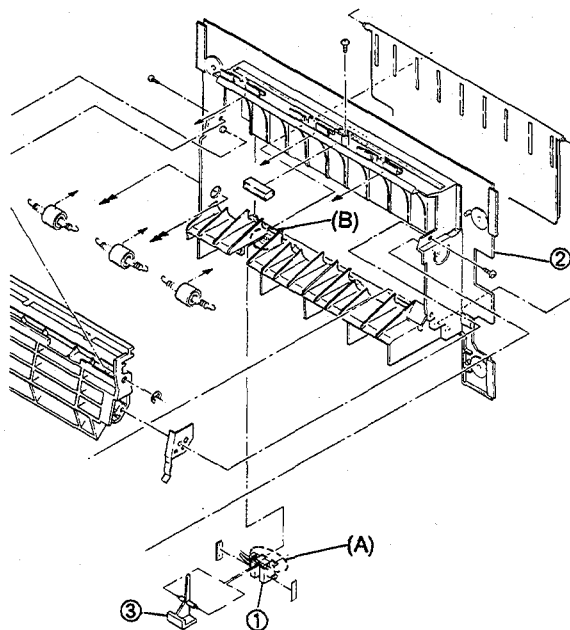


Fig. 8-27

- Remove the left and right cabinets. (See 8-1. External frame.)
- Remove paper exit unit. (See 8-8. Paper exit unit.)
- Remove hook section (A) of paper exit detection switch ① from section (B) of paper exit unit ②.
Remove paper exit detection switch ① from paper exit unit ②.
- Turn actuator ③ in direction of arrow (C) as shown in Fig. 8-28 and remove actuator ③ from actuator mounting port of paper exit detection switch ①.

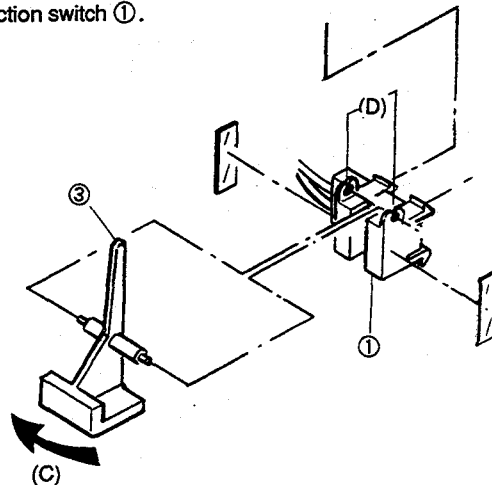


Fig. 8-28

8-8-2. Paper exit roller, transport roller

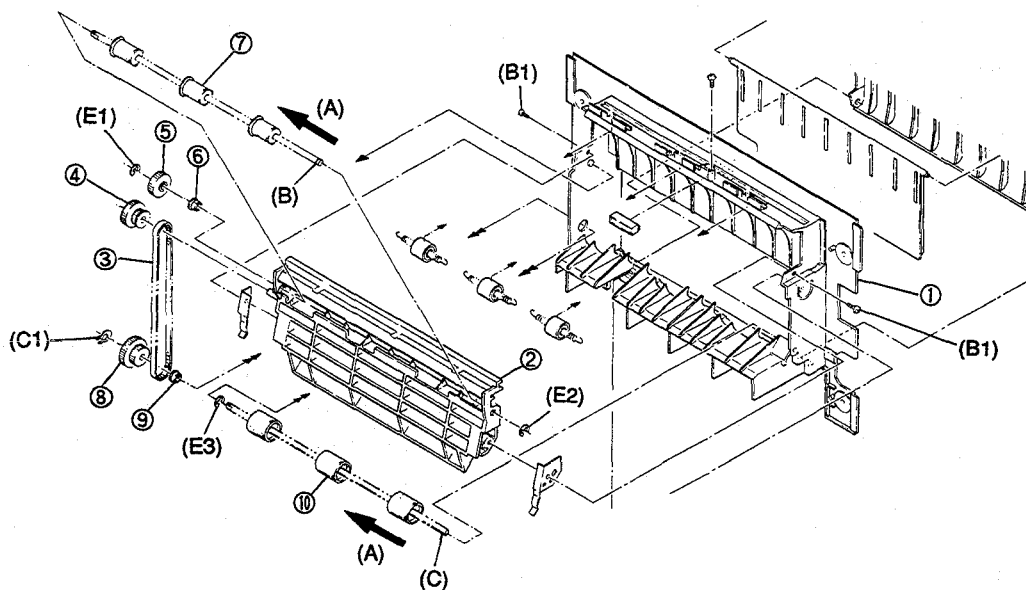


Fig. 8-29

A. Paper exit roller

- Remove the left and right cabinets. (See 8-1. External frame.)
- Remove paper exit unit. (See 8-8. Paper exit unit.)
- Remove two screws (B1) from paper exit unit ①.
- Slightly move the transport guide ② away from the paper exit unit ① and remove the transport belt ③ from the gear ④. Then remove the transport guide ② from the paper exit unit ①.
- Remove E-ring (E1) and remove gear ⑤, bearing ⑥, and paper exit roller ⑦ from the shaft.
- Remove E ring (E2).
- Push paper exit roller ⑦ in direction of arrow (A) to separate section (B) of paper exit roller ⑦ from transport guide ②. Then remove paper exit roller ⑦ in the opposite direction.

B. Transport roller

- Remove the left and right cabinets. (See 8-1. External frame.)
- Remove paper exit unit. (See 8-8. Paper exit unit.)
- Remove C ring (C1).
- Remove gear ⑧ and remove transport belt ③.
- Remove bearing ⑨ from transport roller ⑩ shaft. Remove E ring (E3).
- Push transport roller ⑩ in direction of arrow (A) and separate section (C) of transport roller ⑩ from paper exit unit ①. Then remove transport roller ⑩ in the opposite direction.

8-8-3. U-turn guide

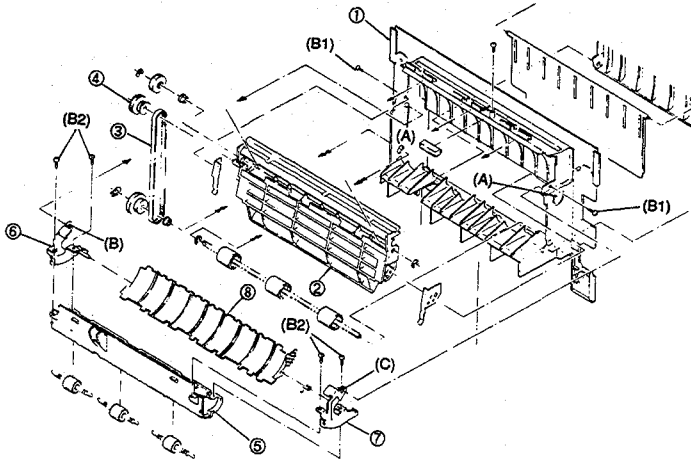


Fig. 8-30

- Remove the left and right cabinets. (See 8-1. External frame.)
- Remove paper exit unit. (See 8-8. Paper exit unit.)
- Remove two screws (B1) from paper exit unit ①.
- Slightly move transport guide ② away from paper exit unit ① and remove transport belt ③ from gear ④. Then remove transport guide ② from paper exit unit ①.
- Remove four screws (B2) and remove guide ⑤.
- Remove section (B) of left angle ⑥ and section (C) of right angle ⑦ from boss (A) of paper exit unit ①. Then remove U-turn guide ⑧ from paper exit unit ①.
- Remove left angle ⑥ and right angle ⑦ from U-turn guide ⑧.

8-9. Main motor unit

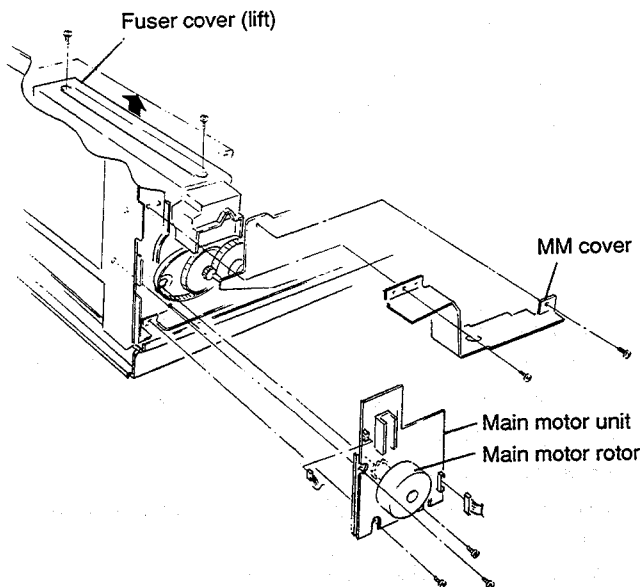


Fig. 8-31

- Remove the left cabinet.
- Disconnect the connectors (2 positions).
- Remove the MM cover.
- Remove the fuser cover screws (2 pcs.) and lift the cover.
- Remove the three screws and remove the main motor unit.

Note for reassembly

- When installing the main motor unit, rotate the rotor a few turns to engage the main motor gear with the frame gear.

8-10. MG drive belt

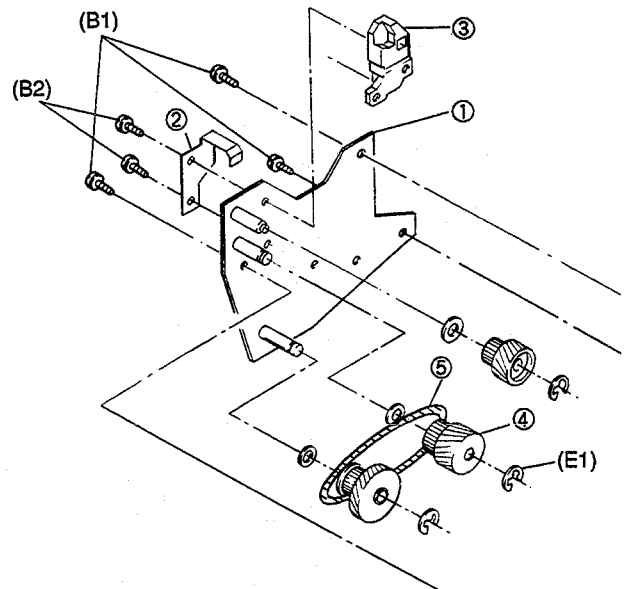


Fig. 8-33

- Remove three screws (B1) and remove junction plate ass'y ①.
- Remove two screws (B2) and remove grounding plate ② and drum holder L ③ from junction plate ass'y ①.
- Remove E ring (E1) and remove 28T gear ④.
- Remove the MG drive belt ⑤.

8-11. ICU PWB unit

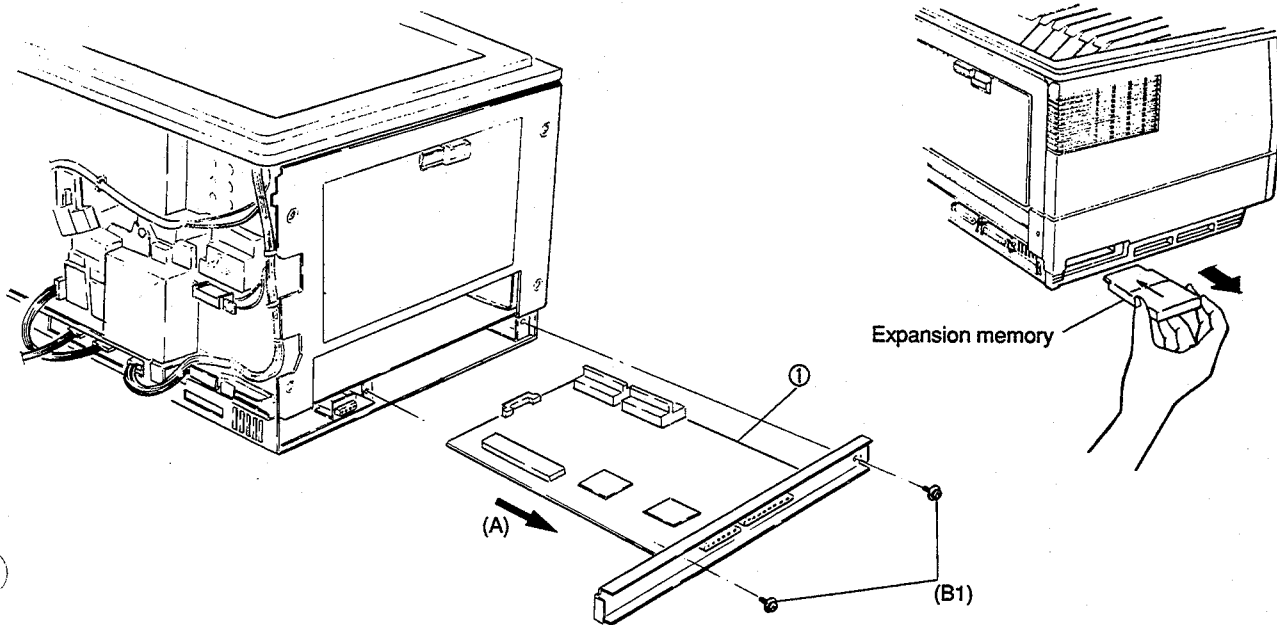


Fig. 8-34

Note: Before removing ICU PWB unit (1), be sure to remove the expansion memory and the font card.

- Remove two screws (B1).
- Remove ICU PWB unit (1) in direction of arrow (A).

8-12. PCU/DC2 PWB unit

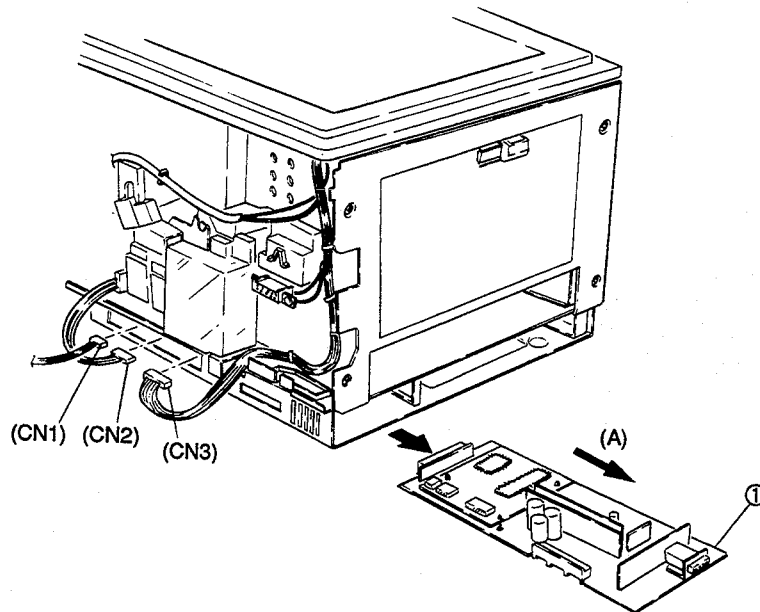
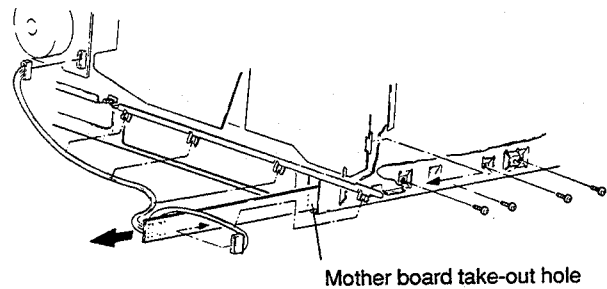
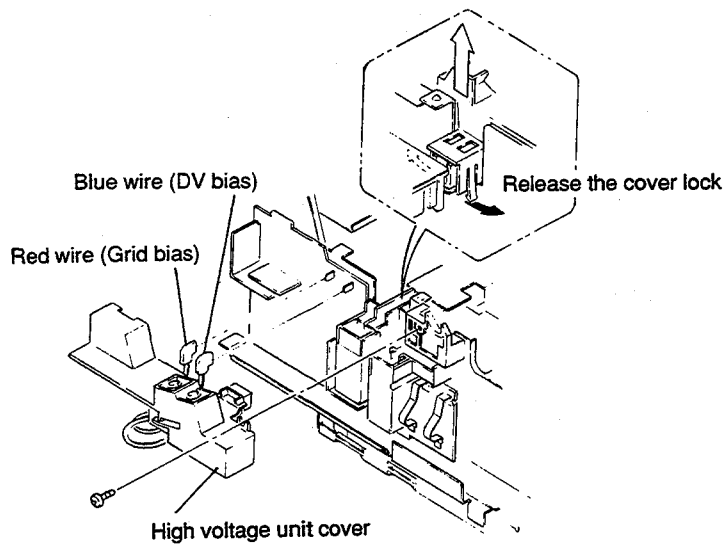


Fig. 8-35

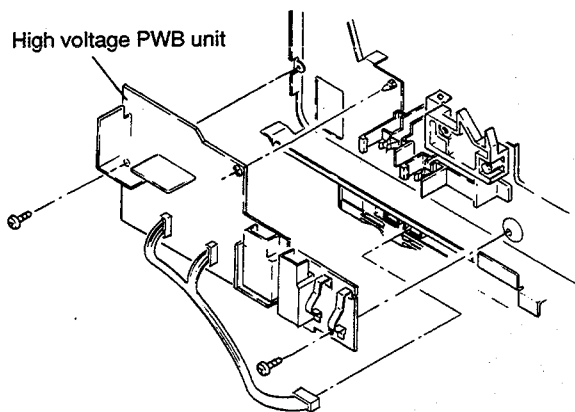
- Remove the AC/DC power unit. (See 8-2. AC/DC power unit.)
- Remove the ICU PWB unit. (See 8-11 ICU PWB unit.)
- Disconnect all the connectors (CN1), (CN2), and (CN3), of PCU/DC2 PWB unit ①.
- Remove PCU/DC2 PWB unit ① in direction of arrow (A).

8-13. High voltage PWB unit

- Remove the right, left, and front cabinet.
- Remove the lock unit.
- Remove the paper feed unit.
- Remove the high voltage unit cover.



- Remove the connector and remove the two screws.
- Remove the PWB unit from the supporter.



8-14. Mother board

- Remove the PCU and ICU.
- Remove the front cabinet.
- Remove the four fixing screws of the mother board.
- Remove the solenoid and the MM connector.
- Cut the snap band and remove the mother board from the mother board take-out hole.

[9] ADJUSTMENTS

1. Pick up roller location adjustment (angle)

Adjustment is required for any of the following reasons:

- When a misfeed occurred in the paper feed block.
- After disassembly or replacement of a component.

[Check procedure]

- ① Remove the paper feed unit from the printer, in reference to 8-5. Paper feed unit.
- ② As shown in Fig. 9-0, turn the paper feed drive gear in the arrow direction (A) until the clutch sleeve protrusion makes contact with the PF solenoid. Fig. 9-1 shows the figure when viewed from the solenoid PWB side.

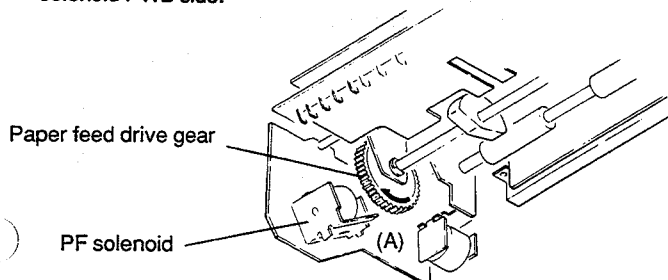


Fig. 9-0

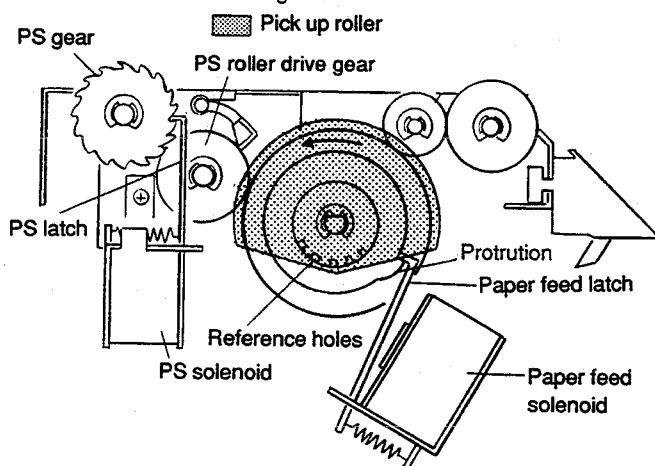


Fig. 9-1

- ③ In this state, check the angle formed by the lower surface of the pick-up roller and the plate section (hatched section) to confirm that angle "a" is virtually the same as angle "b" as shown in Fig. 9-1B. (The allowance is +10 degrees, -5 degrees for either of "a" and "b".)

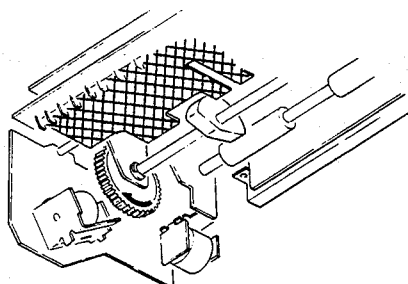


Fig. 9-1A

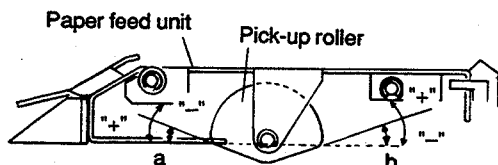
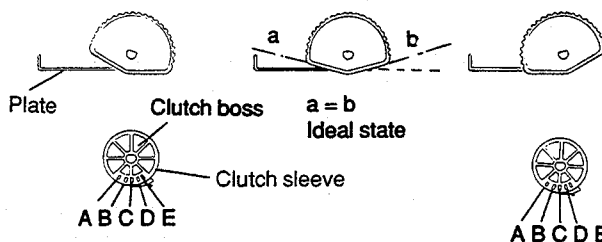


Fig. 9-1B [Viewed from the side opposite to the solenoid PWB]

- ④ If the angles are not within the allowable range, perform the following adjustment.

- a. Check the pick-up roller angle shift according to the above check procedure.
- b. As shown in Fig. 9-2, change the mounting position of the clutch spring according to the angle shift direction.



A - E: Mounting position of clutch spring

Shift the mounting position in direction A.

Shift the mounting position in direction E.

Fig. 9-2

To change the mounting position of the clutch spring, perform the following procedure.

- b-① Remove the solenoid PWB. (See 8-5-2. solenoid PWB.)

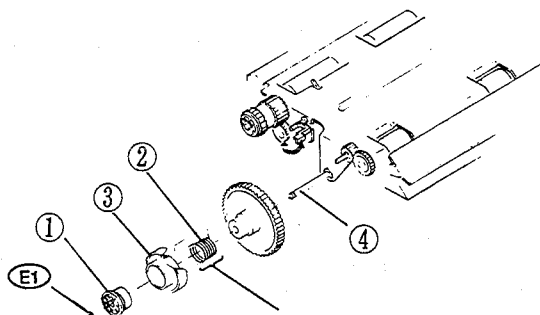


Fig. 9-3

- b-② Remove E-ring (E1).
- b-③ Remove clutch boss ①, clutch spring ②, and clutch sleeve ③ from pick-up roller ④.
- b-④ Adjust the mounting position of clutch spring ② on clutch boss ①. Insert into pick-up roller ④ again.
- b-⑤ Check the angle shift of the pick up roller ④. If it is outside the specified range, readjust the mounting position of clutch spring ②. If it is O. K., then attach E-ring (E1).

Note: When the clutch is disassembled, apply grease (UKOG-0062FCZZ) to clutch spring ②.

2. Optical system unit assembly position adjustment

A. Lead edge skew adjustment

If lead edge skew is out of limits 0 to 1mm (within 8inch length), it has to be adjusted in the following manner:

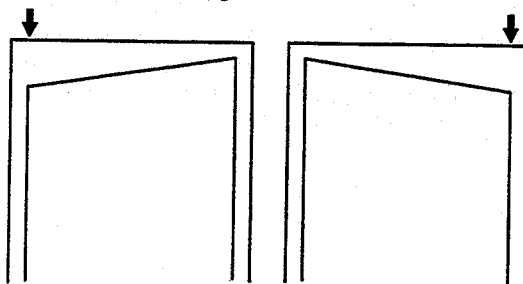
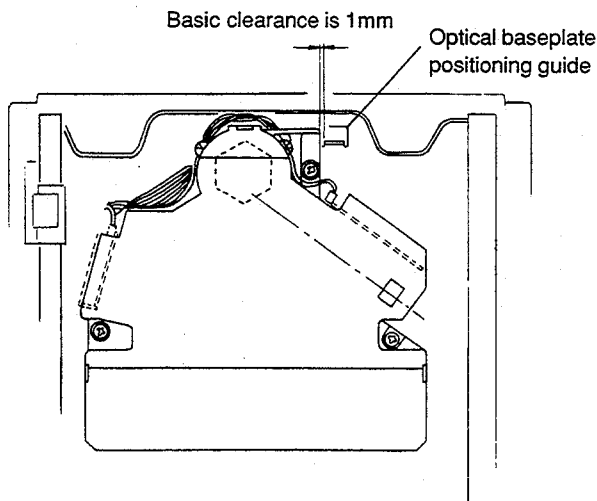


Fig. 9-4

- ① If printed right side up, increase the clearance between the optical baseplate positioning guide and the optical system case protrusion by 0.5mm. (basic clearance is 1mm)
If printed opposite, decrease the clearance by 0.5mm.
- ② With the MENU and ENTER key depressed at the same time, turn power on to go into the service engineer diag mode.
- ③ Depress the MENU key for the TEST PRINT, then push the FORM FEED key.
- ④ Measure the lead edge print area using the lateral stripe printing to make sure it is within the limits.
If not within the limits, repeat from step ① again.



B. Lead edge adjustment

If the lead edge of the printout is not within the limits (3.1 to 6.1mm), observe the following procedure to adjust it.

- ① Turn power on while depressing the MENU key with the ENTER key at the same time. Depress the MENU key to pick up the "TOP MARGIN 00".
- ② If it was below the limit, push the up-arrow key. The value increments 1/100 inch (0.25mm) each time the key is depressed. Use the down-arrow key, if it was above the limit.
- ③ Push the FORM FEED switch to obtain the lateral stripe printout and measure the lead edge area. If it is not within the limits yet, push the Δ key or the ∇ key and push the FORM FEED key again. If it was within the limit, turn power off.

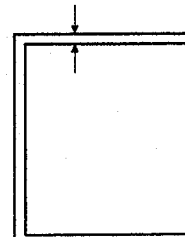
C. Left margin adjustment

If the left margin is not within the limits (4.2mm - 2mm to +2mm), observe the following procedure to adjust it.

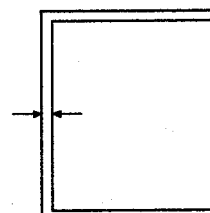
- ① Turn power on while depressing the MENU key with the ENTER key at the same time.
- ② Push the MENU key to pick up. "LEFT MARGIN 00".
- ③ If it was below the limit, push the up-arrow key. The value increments 1/100 inch (0.25mm) each time the key is depressed. Use the down-arrow key, if it was above the limit.
- ④ Push the FORM FEED switch to obtain the lateral stripe printout and measure the margin area. If it was not within the limits yet, push the Δ key or the ∇ key and push the FORM FEED key again. If it was within the limit, turn power off.

8-2. Print accuracy

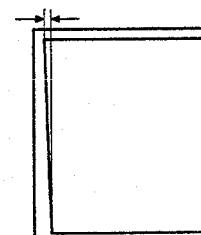
- A. Top margin
1/5" -2mm to +1mm



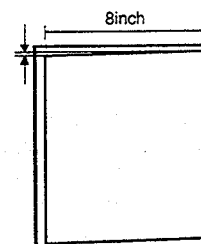
- B. Left margin
1/6" -2mm to +2mm
(For PCU diagnostics, 10mm -2mm to +2mm)



- C. Skew
8-1/2" x 11" landscape, 2mm, maximum
2mm, maximum



- D. Lead edge skew
1mm, maximum



The specifications are not for assuring the print quality over the maximum printable area, but for showing the maximum printable area.

The actual print area can be specified by the controller.

[10] TEST PRINT AND DIAGNOSTICS

The base engine conditions can be checked with the following test print and PCU diagnostics.

- Test print

When the TEST key on the operation panel is depressed, the controller is operated to print part of the built-in font diagonally.

- PCU diagnostics

The PCU diagnostics are provided for the service engineers to check the conditions of each section of the base engine.

PCU DIAGNOSTICS SPECIFICATIONS

1. Entering the DIAGNOSTIC mode

Keep the MENU and ENTER keys depressed, turn on the power switch.

4. List of the functions

Menu	Function	Execution	Cancel																										
TOP MARGIN XX	Lead edge adjustment value setting Set with Δ and ▽ keys. Print a sheet with FORM FEED key. XX=00 – 99(1 count: 1/100inch) Adjust the setting value so that the top margin is 1/5" –2mm +1mm.	[FORM FEED]	After printing																										
LEFT MARGIN XX	Left margin setting Set with Δ and ▽ keys. Print a sheet with FORM FEED key. XX=20 – 99(1 count: 1/100inch) Adjust the setting value so that the left margin is 10 ± 2mm. (When the value is set to the above range, the left margin is 1/6" ± 2mm when ICU SELF-TEST#2 is performed.)	[FORM FEED]	After printing																										
SW SCAN XX	The internal SW active state is displayed by LED. Select SW NO. with Δ and ▽ keys. XX = 01 – 04 (When 03 is being executed, EXPFS and PFMD are on. When 04 is being executed, ENFMD is on.) Note: Switch check with * mark should be performed with the upper frame closed. <table><tr><th>SW NO.</th><th>LED</th><th>READY</th><th>MANUAL</th><th>ONLINE</th><th>DATA</th></tr><tr><td>01</td><td>DOOR OPEN</td><td>PIN*</td><td>HFIN*</td><td>POUT*</td></tr><tr><td>02</td><td>PE*</td><td>PS1</td><td>PS2</td><td>PS3</td></tr><tr><td>03</td><td>EXPE*</td><td>EXPS1</td><td>PXPS2</td><td>EXPS3</td></tr><tr><td>04</td><td>ENPE</td><td>ENCON</td><td>EXCON</td><td>TE</td></tr></table>	SW NO.	LED	READY	MANUAL	ONLINE	DATA	01	DOOR OPEN	PIN*	HFIN*	POUT*	02	PE*	PS1	PS2	PS3	03	EXPE*	EXPS1	PXPS2	EXPS3	04	ENPE	ENCON	EXCON	TE	FORM FEED]	[RESET]
SW NO.	LED	READY	MANUAL	ONLINE	DATA																								
01	DOOR OPEN	PIN*	HFIN*	POUT*																									
02	PE*	PS1	PS2	PS3																									
03	EXPE*	EXPS1	PXPS2	EXPS3																									
04	ENPE	ENCON	EXCON	TE																									
COUNTER SET XXX	Life counter set Select with Δ and ▽ keys. XXX = PRN : Printer life OPC : Drum cartridge life DV : Developer cartridge life Every two digits are set from the bottom. The two blinking digits can be set. Δ : Count up ▽ : Count down ENTER : To the next digit	FORM FEED]	[RESET]																										
NVRAM INITIAL	NVRAM initialization Left : 50 Printer life : 200,000 Top : 50 Drum cartridge life : 50,000 Developer cartridge life : 25,000	FORM FEED]	[RESET]																										

2. Executing DIAGNOSTIC function

Select the menu with the MENU and Δ , ∇ keys, and execute diagnostic function with FORM FEED keys.

To return to the menu during execution of diag function, press the RESET key.

3. DIAGNOSTIC display

When the machine enters into DIAG mode:

1. All LED's are lighted for 1 sec.
2. "PCU DIAG MODE X" is displayed. (X: PCU ROM version)

When diagnostic is being executed:

DATA LED is blinked.

Menu	Function	Execution	Cancel
[COUNTER RESET]	Life counter reset Printer life : 200,000 Drum cartridge life : 50,000 Developer cartridge life : 25,000	[FORM FEED]	[RESET]
[DIAG EJECT]	End of diagnostic	[FORM FEED]	
[OPTICAL SYS TEST]	Optical system test Note: If this test is performed for a long time with the drum cartridge installed, the photoconductor may be damaged. Error is not detected. (Cover open and C3 are not detected) Polygon motor and laser are on. When SYNC is detected, ONLINE (LED) lights up. With the cover open, the polygon motor and the laser are not turned on.	[FORM FEED]	[RESET]
[VOL TEST XX]	High voltage PWB test (30 sec ON) Select with Δ and ∇ keys. XX = MC : Main corona, grid HIGH GRL : Main corona, grid LOW TC : Transfer corona BS : Main corona & bias Note: If the drum cartridge is not installed, the grid bias and the DV bias are not outputted. If this test is performed for a long time, the photoconductor may be damaged.	[FORM FEED]	[RESET]
[TEST PRINT] (For factory test)	Test print Select MODE with the MENU, ENTER, Δ, and ∇ keys. [JAM XXX] XXX = ON : YES OFF : NO Set to OFF to operate without paper. [HEATER XXX] XXX = ON : Temperature control YES OFF : Heater OFF [MULTI XXX] XXX = ON : Multiple OFF : Single [LIFE XXX] XXX = ON : Life over error YES OFF : Life over error NO When set to ON, the machine will stop by "Life over." [CASSETTE XXX] XXX = STD : Standard cassette OPT : Option cassette ENV : Envelope [TONER XXX] XXX = ON : Toner empty YES OFF : Toner empty NO When set to ON, the machine will stop by "Toner empty."	[FORM FEED]	[RESET] (After printing)
[TOTAL XXXXXX]	Total counter display		

[NOTE] Except for test print, no error detection.

No paper-empty detection in any print mode of the PCU diag.

Note: If printing is performed without paper, JAM error is displayed.

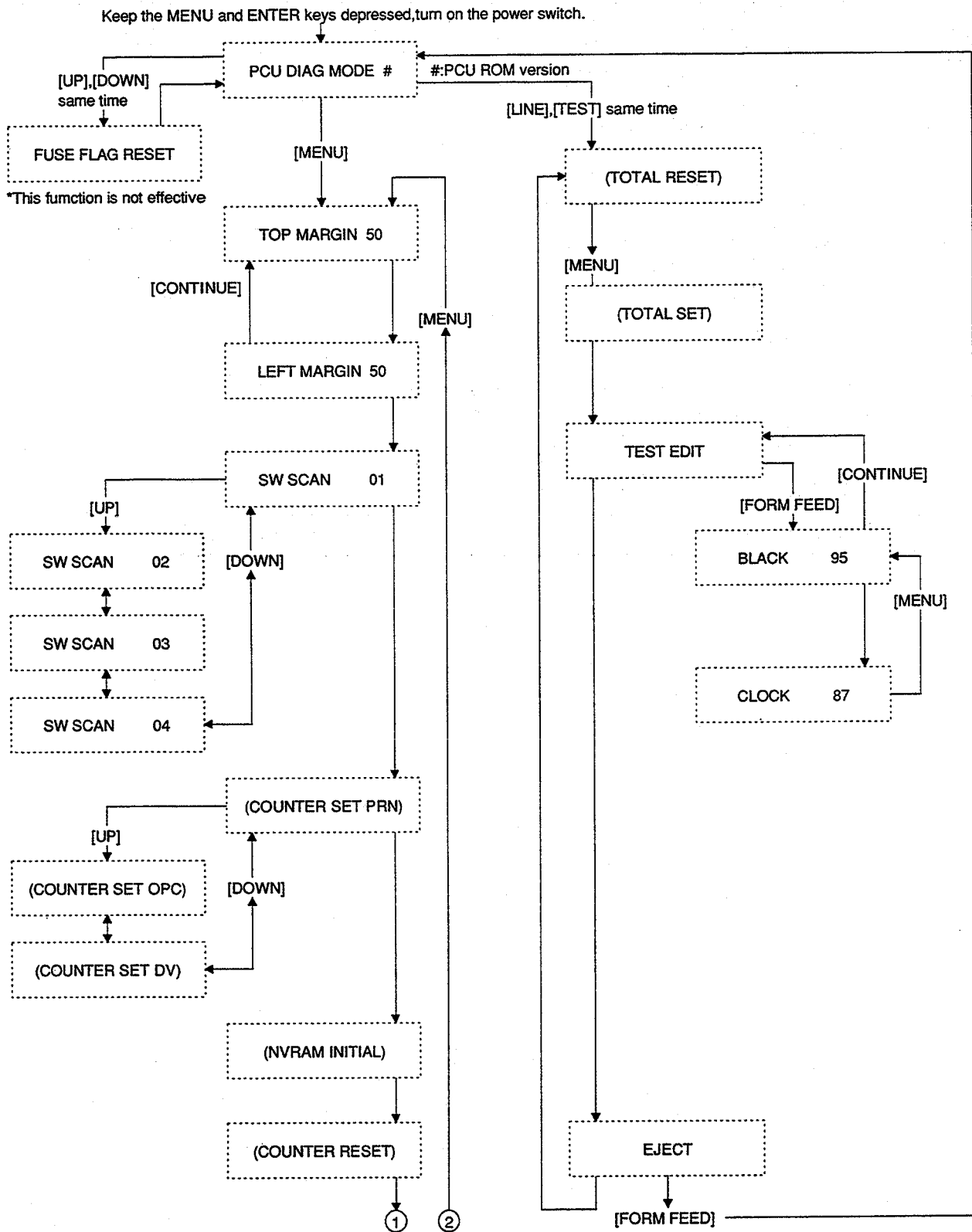
5. Entering special diagnostic function

When [PCU DIAG MODE X] is displayed, press the LINE and TEST keys.

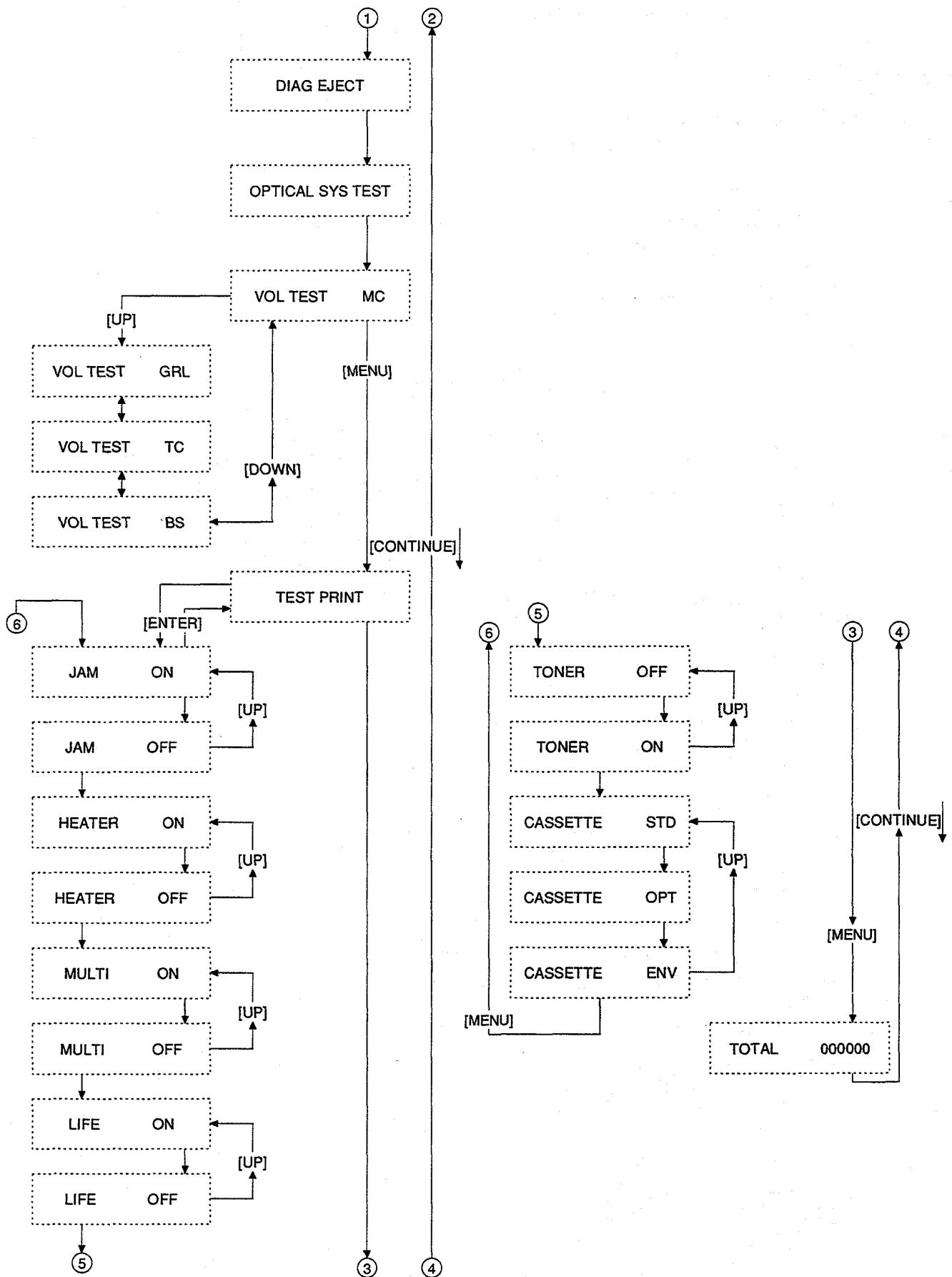
6. List of special diagnostic functions

Menu	Function	Execution	Cancel
[TOTAL RESET]	Total counter reset. TOTAL: 000000 (Life counter all reset)	[FORM FEED]	[RESET]
[TOTAL SET]	Total counter set Setting is made by two digits from the top. Δ : Count up ▽ : Count down ENTER : To the next digit	[FORM FEED]	[RESET]
[TEST EDIT]	Test print pattern change Select MODE with FORM FEED, MENU, Δ, and ▽ keys. [BLACK XX] XX = 00 ~ 99 00 = White, 70-89 = Black, 90-99 = Half tone, The other figures are not specified. [CLOCK XX] Setting of the horizontal length } This function is not XX = 00 ~ 99 } effective. To print the print pattern which was changed with test edit. Print pattern is changed with test edit. → [EJECT] → [PCU DIAG MODE #] → Test print selection → Test print is executed.	[FORM FEED]	[RESET]
[EJECT]	Returns from special diag to normal diag.	[FORM FEED]	

7. PCU DIAG operating sequence



PCU DIAG operating sequence



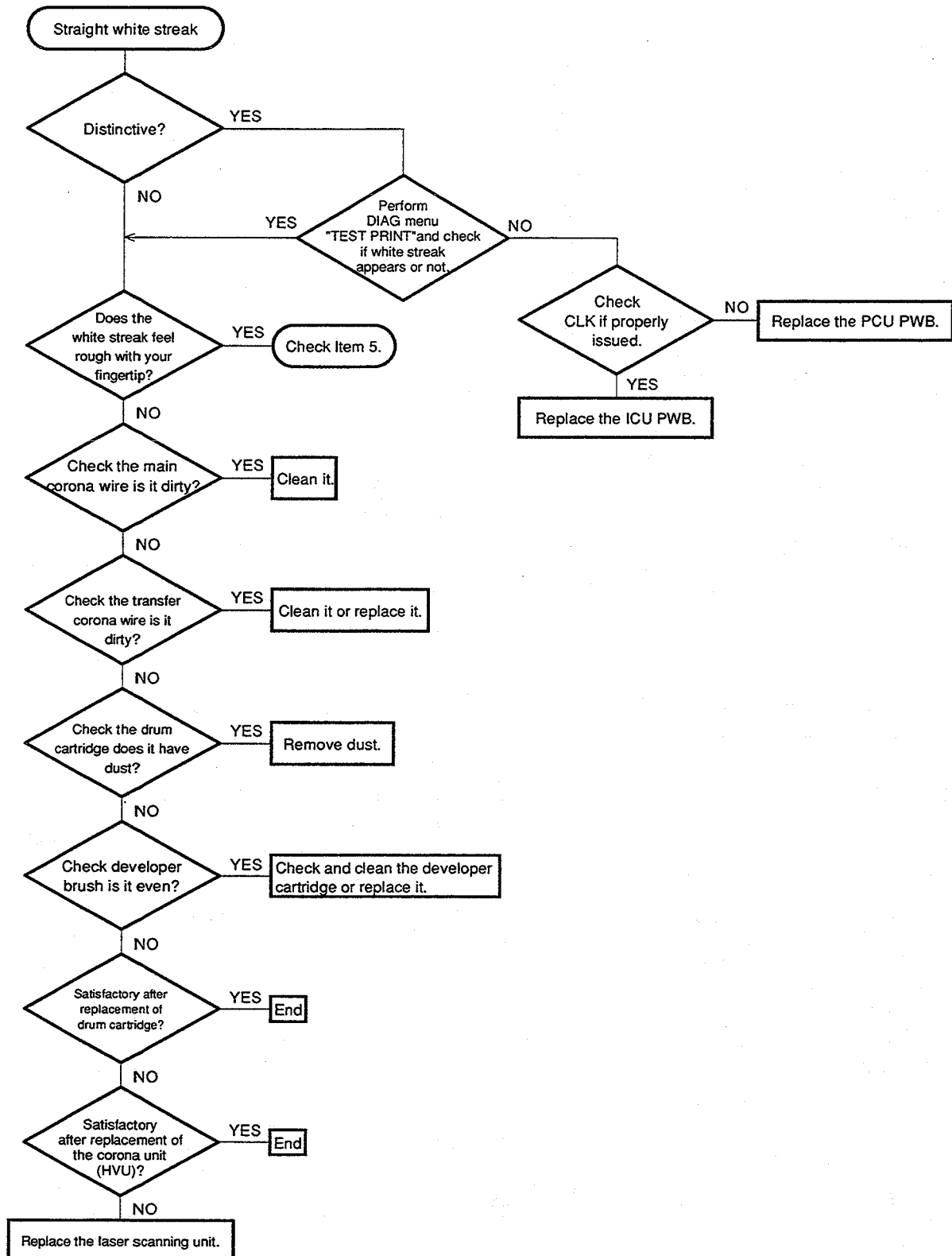
[11] TROUBLESHOOTING

Troubleshooting (A) is for printing problems, and troubleshooting (B) is for error codes.

(A) Printer troubleshooting

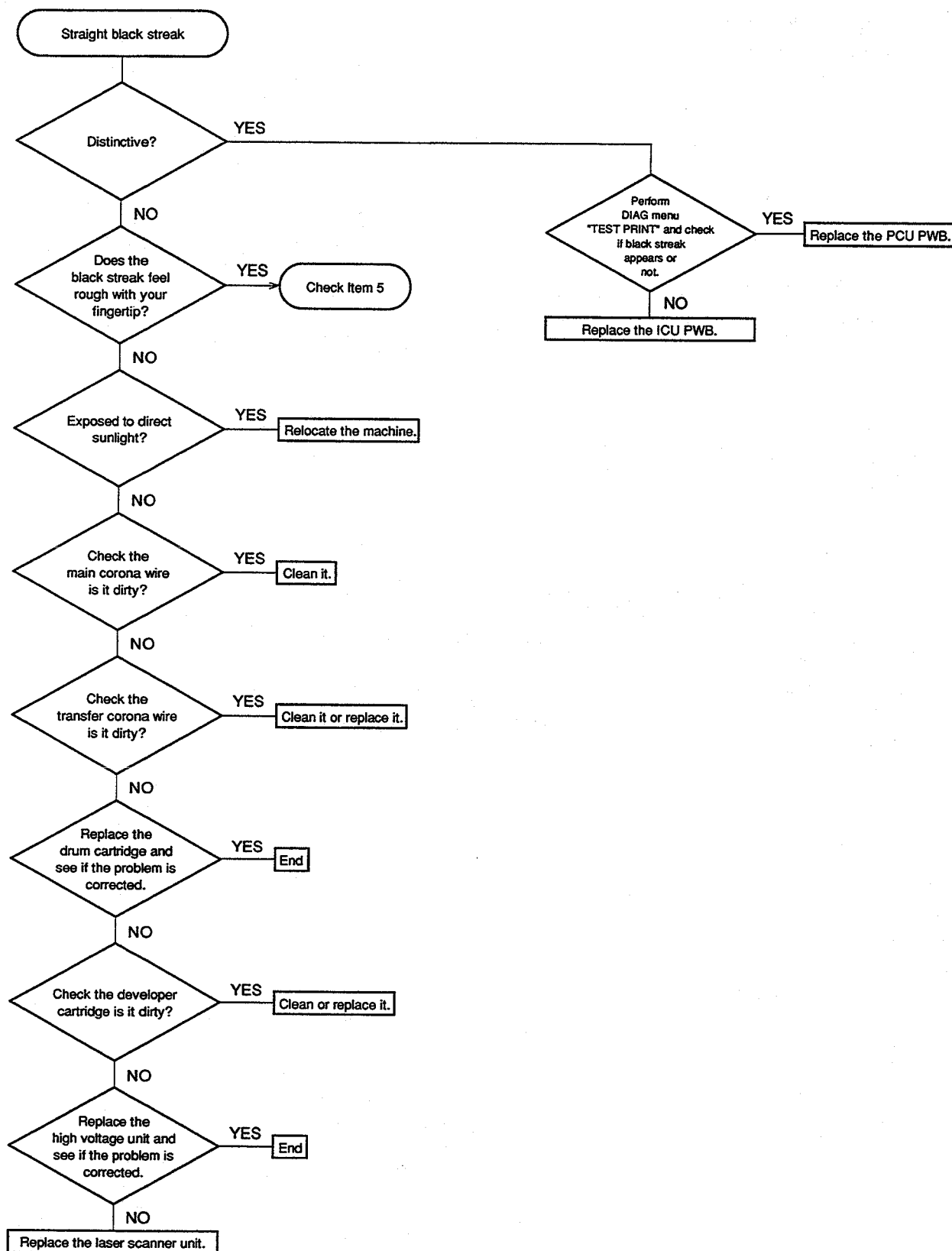
1. White line appearing vertically on print

- Appearance of white streak or band in the paper feeding direction



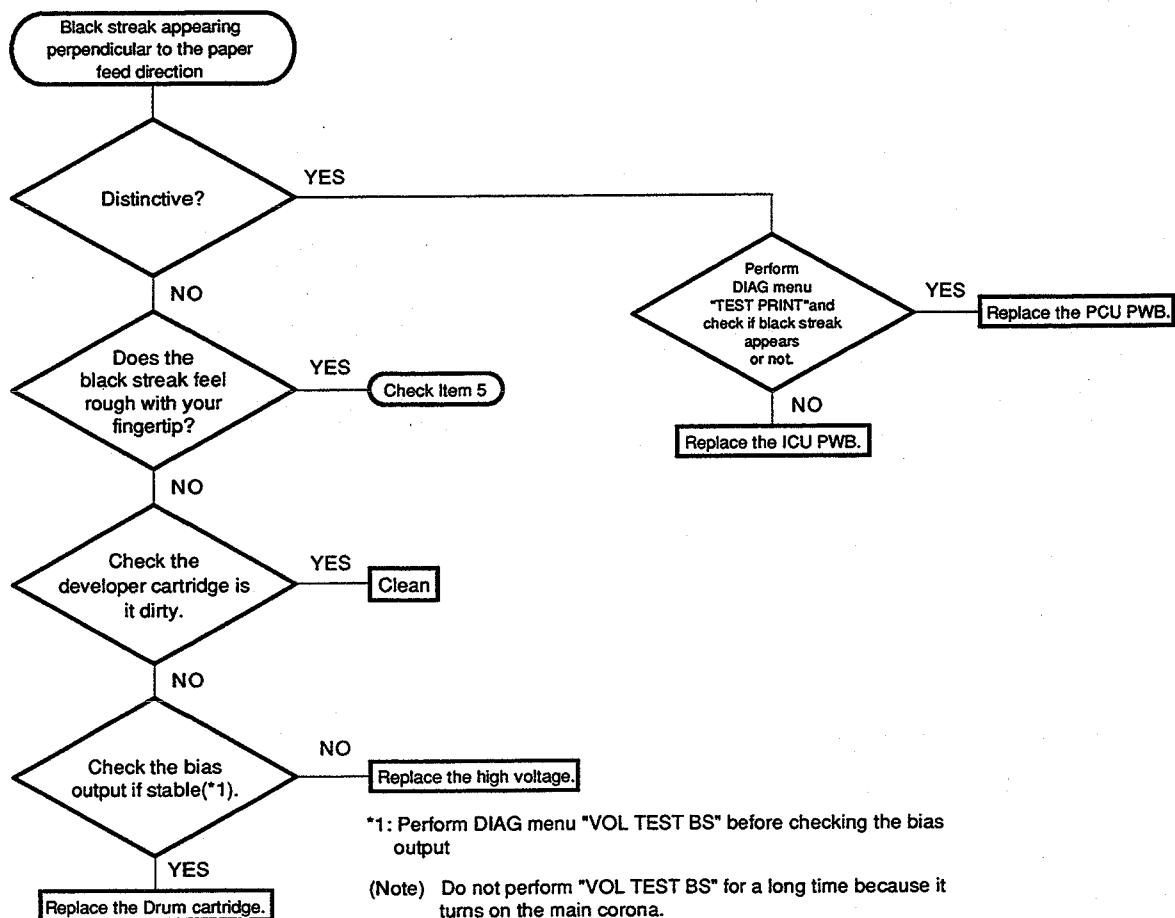
2. Black line appearing vertically on print

■ Appearance of black streak or band in the paper feeding direction



3. Black line appearing horizontally on print

- Appearance of black streak or band perpendicular to the paper feeding direction

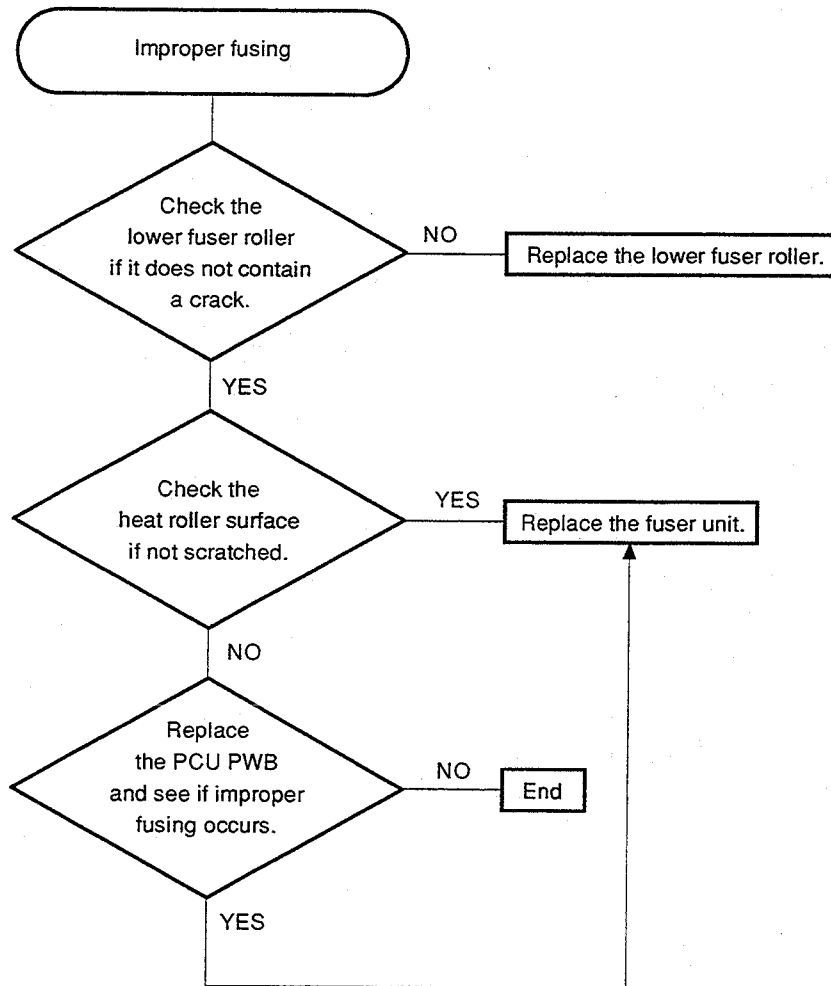


*1: Perform DIAG menu "VOL TEST BS" before checking the bias output

(Note) Do not perform "VOL TEST BS" for a long time because it turns on the main corona.
Complete the measurement in a few seconds.

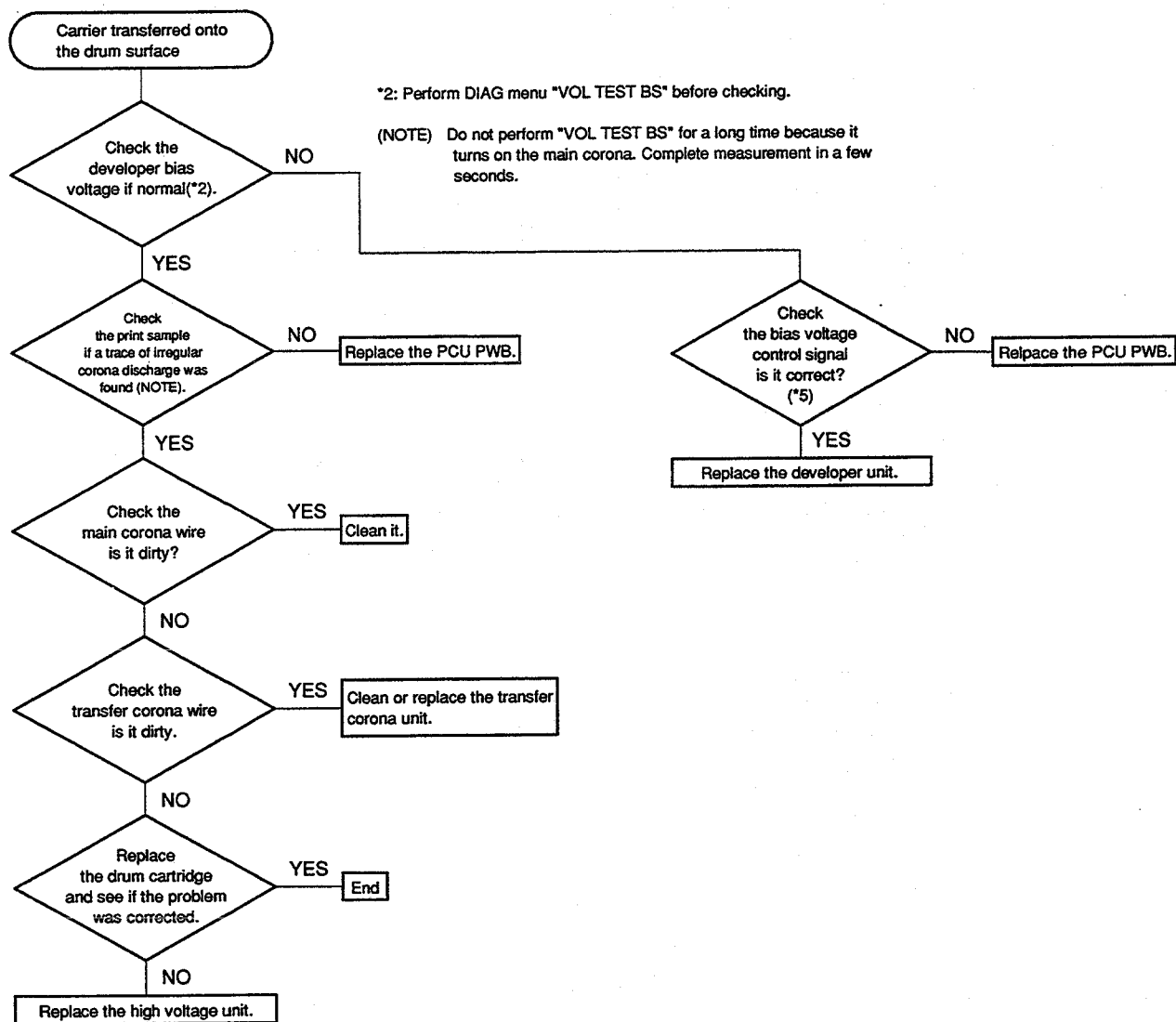
4. Poor fusing

- Printed image felt rough and toned image easily wiped away with your fingertip



5. Carrier transferred onto the drum surface

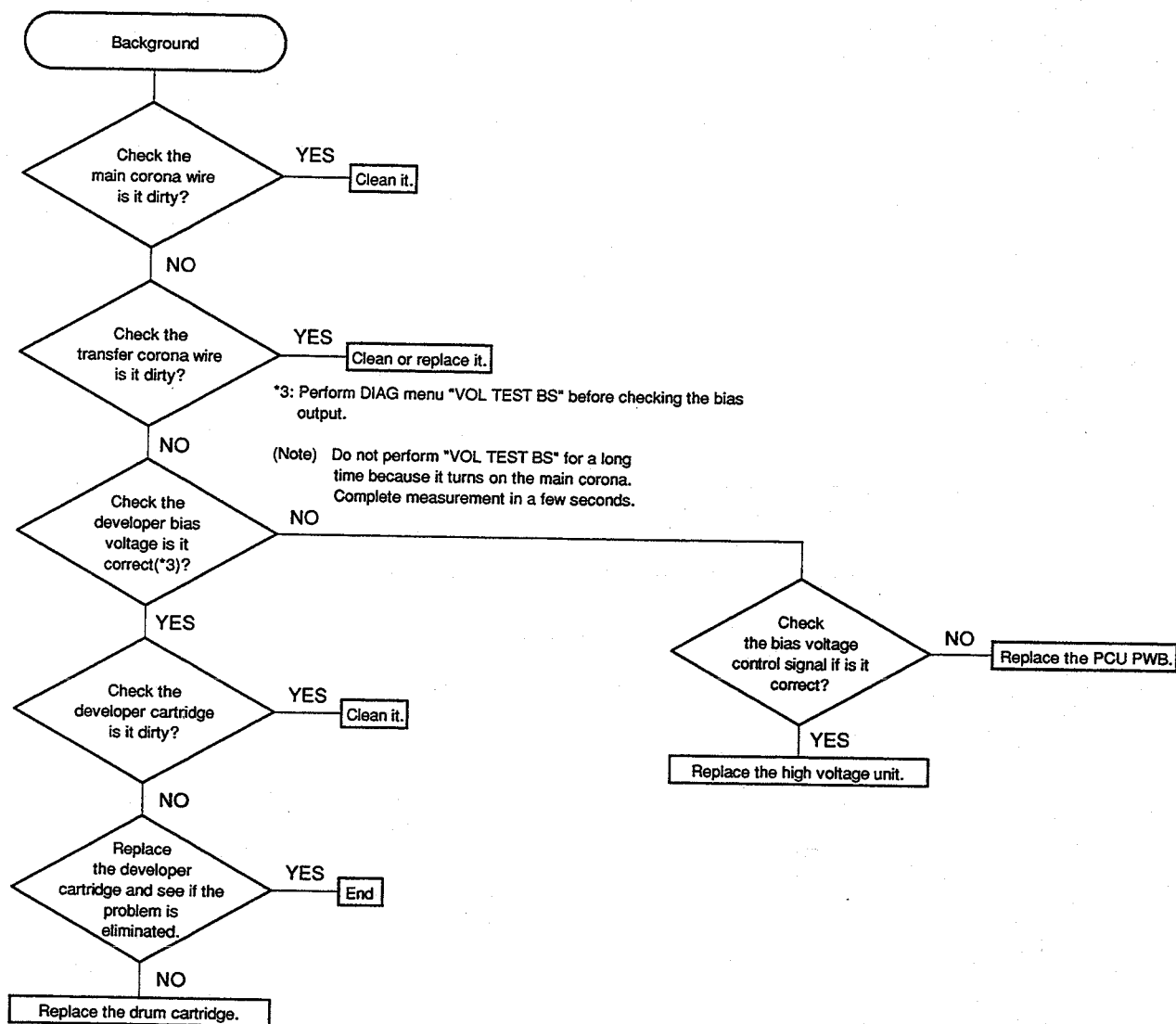
- Printed image felt rough and toned image easily wiped away with your fingertip



NOTE: Black or white bands may appear in the paper feeding direction if it is an irregular corona discharge.

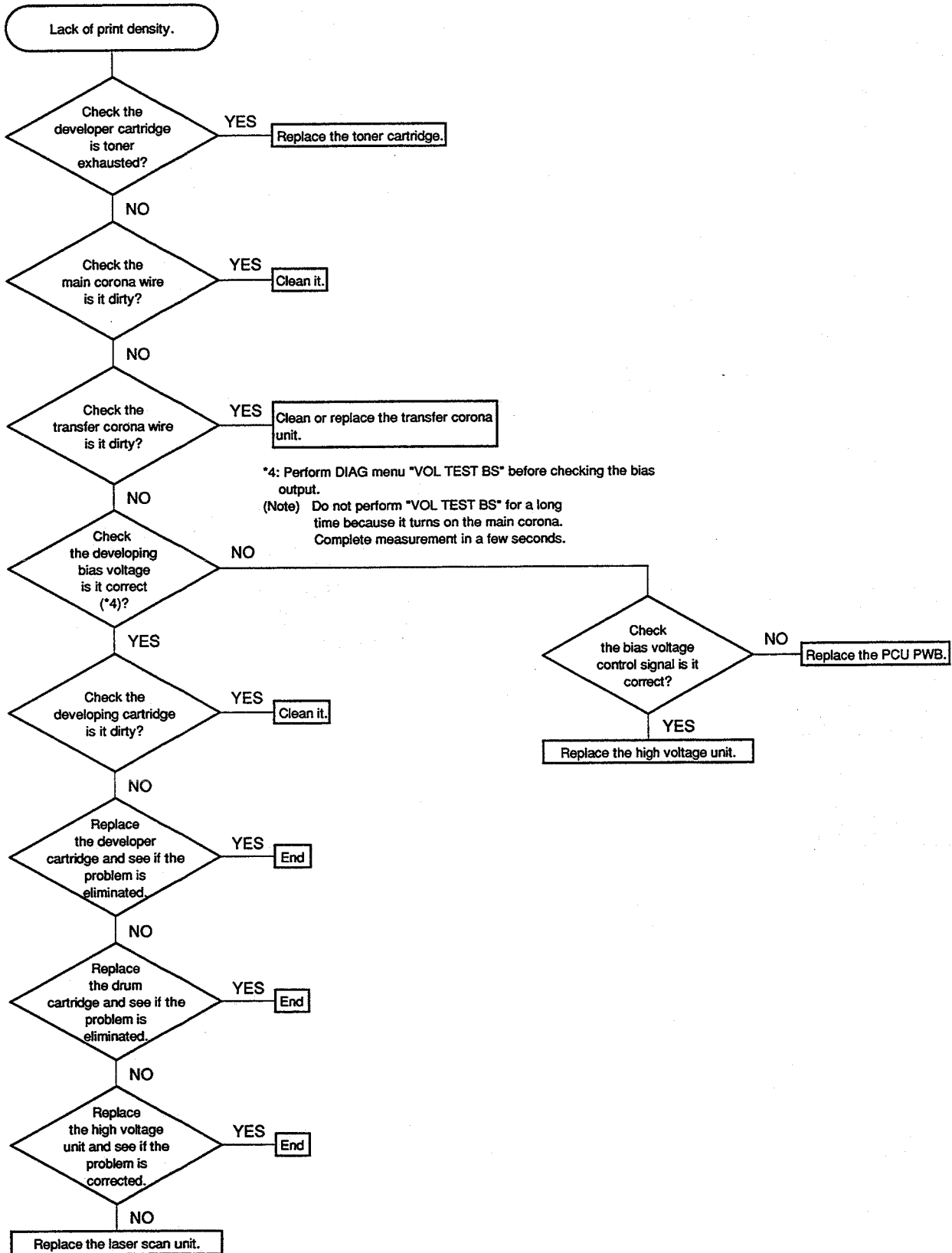
6. Background

- Background copied on a part or on the entire area of print



7. Lack of print density

■ Extremely light print density



(B) Troubleshooting for error code

1. Error types

Operator call error

Error Message	Description	Remedy
INPUTBUFFER FULL	The host computer ignores the printer's busy state and continues to send data.	Check the protocol signal line between the printer and the host computer or adjust the setting. Press the CONTINUE/RESET key.
FC MISMATCH *** (*** = A, B, A & B)	Font card hardware error or mismatch of font card emulation and printer setting. Printing without the required font card.	Insert a normal font card or one matching the emulation. Press the CONTINUE/RESET key.
COVER OPEN	Upper unit of printer is not closed properly.	Close upper unit firmly and check that it is properly latched. Press the CONTINUE/RESET key.
INTERFACE ERROR	RS-232C interface error (For example, framing error, parity error, etc.)	Check the RS-232C interface function and execute it again. Press the CONTINUE/RESET key.
DATA LOSS ERROR	Too many characters on one line.	Delete excess characters and execute again. Press the CONTINUE/RESET key.
PAPER OUT	Paper empty or paper cassette removed.	Add paper or replace the paper cassette. If the paper size matches the previous setting, the printer will return on-line.
PAPER JAM	Paper is jammed.	Open the cover and remove the misfed paper. Press the CONTINUE/RESET key.
REPL. DEVELOPER	End of developer cartridge life.	Replace the developer cartridge.
REPL. PHOTO. DURM	End of photoconductor cartridge life.	Replace the photoconductor cartridge.
REPL. TONER KIT	Toner cartridge is almost empty.	Replace with a new toner kit.
REPL. TONER COLL.	Toner collecting container is not installed properly. Toner collecting container was not replaced when replacing the toner kit.	Install the toner collecting container properly. Replace the toner collecting container.

Error Message	Description	Remedy
DATA MEMORY FULL	If on-line and printing, printing will continue on to the next page. While entering soft font or macro, the printer goes off-line.	When space becomes available in the user memory, press the CONTINUE/RESET key. Option 1: Press the CONTINUE/RESET key. The soft font or macro being entered prior to going off-line is deleted and the printer goes back on-line. Option 2: Press and hold the ENTER/RESET key until "RESET" appears on the display. All temporary soft fonts and macros are deleted and the printer goes back on-line.

The waste toner box must be replaced when toner is refilled. If not, the machine will not operate.

(NOTE)

When the above error occurs, the printer goes into the off-line mode.

Even after the error task is performed and the RESET key is pressed to clear the error, the printer will remain in the off-line mode.

To resume the operation, switch the mode to the on-line mode.

Service engineer call error

Work by the service engineer is required when one of the following errors is displayed.

- P1 to P4
A fault in the PCU (process control unit).
- C1 to C6
Printer mechanism fault.
- E1 to E5
A fault in the ICU (interface control unit).

Service engineer call error

Error status display	Error description
SERVICE (P1)	PCU ROM Checksum Error
SERVICE (P2)	PCU RAM Read/Write Error
SERVICE (P3)	Non-volatile RAM Read Error
SERVICE (P4)	Serial Communication Error
SERVICE (P5-P6)	(Reserved)

Error status display	Error description
SERVICE (C1)	Optical System Error
SERVICE (C2)	Main Motor Defective
SERVICE (C3)	Polygon Motor Defective
SERVICE (C4)	High Heater Temperature
SERVICE (C5)	Low Heater Temperature
SERVICE (C6)	Thermistor Open
SERVICE (C7-C9)	(Reserved)

Error status display	Error description
SERVICE (E1)	ICU ROM Checksum Error
SERVICE (E2)	ICU RAM Read/Write Error
SERVICE (E3)	Expansion Memory Error
SERVICE (E4)	ICU Hardware Read/Write Error
SERVICE (E5)	Non-volatile RAM Checksum Error
SERVICE (E6-E9)	(Reserved)

2. Error check point

	Cause	Error description		Action
	COVER OPEN	1) Check the upper frame if not open. 2) Check the DSW24 or lock plate switch if it operates normally. 3) Check the FD guide arm if it operates normally. 4) Check that IC1 (CPU) 51 pin voltage is about 5V.	Yes No No No Yes	Close the upper frame. Replace the DSW24 or lock plate switch with a new one. Replace the FD guide arm with a new one. Contact failure. Replace the CPU (μ PD78214) with a new one.
	PAPER JAM	1) Check the machine for paper. 2) Check the paper detect sensor actuator, if normal. 3) Turn on and off the actuator and check that IC2 (PCUGA) 26 pin or 27 pin signals turn from high to low.	Yes No No Yes	Remove the paper. Replace the paper detect sensor. Replace the paper detect sensor Contact failure Replace IC2 (PCUGA) with a new one.
	PAPER OUT	1) Check the paper cassette, if empty. 2) Check the paper empty sensor actuator, if normal. 3) Turn on and off the paper empty sensor and check that IC2 (PCUGA) 13 pin signal is changed from High to Low.	Yes No No Yes	Replenish paper in the cassette. Replace the paper empty sensor. Replace the paper empty sensor Contact failure Replace IC2 (PCUGA) with a new one.
P1	PCU ROM Sum-check error	Check the CPU if the correct one is used.	Yes	Replace the CPU (μ PD78214) with a new one.
P2	PCU RAM read/writ error	Check the CPU if the correct one is used.	Yes	Replace the CPU (μ PD78214) with a new one.
P3	NVRAM read error	1) Check the CPU, if operating normally. Check CE and SK received at power on.	No Yes	Replace the CPU (μ PD78214) with a new one. Replace IC3 (S2444R) with a new one.
P4	Serial communication error	1) Check that STS signal is normally supplied from PCUGA 75 pin to ICU. 2) Check that CMD signal is normally supplied to PCUGA 2 pin.	No No	Replace LPU or PCUGA with a new one. Check ICU and the mother board.
C1	Optical system failure	1) Check LDON, VIDEO if received correctly. 2) Check that SYNC is normally supplied to PCUGA 11 pin.	No No	Replace IC2 (PCUGA) with a new one. Replace the optical unit with a new one.
C2	Main motor failure	1) Check +24V if properly supplied. 2) Check MMD if properly received when the motor is on. 3) Check MMTLK if properly received when the motor is on.	No No No	Replace the power supply unit with a new one. Replace IC4 (μ PA2003C) with a new one. Replace the motor with a new one.
C3	Polygonal motor failure	1) Check +24V if properly issued. 2) Check PMD if correctly received when the polygonal motor is on. 3) Check PMTLK if issued properly when the polygonal motor is on.	No No No	Replace the power supply with a new one. Replace IC2 (PCUGA) with a new one. Replace the optical unit with a new one.
C4	Irregularly high heater temperature	1) Check the resistance across the thermistor if 100kilohms at room temperature of 25°C. 2) Check HLON if properly issued, not always at a low. 3) Check the P1 phototriac within the power supply unit if operating normally.	No No No	Replace the thermistor with a new one. Replace IC4 (UPA2004C) with a new one. Replace P1 with a new one.
C5	Irregularly low heater temperature	1) Check the resistance across the thermistor if 100kilohms at room temperature of 25°C. 2) Check HLON if at a low during warmup. 3) Check P1 phototriac is it on during warmup. 4) Check the heater wire and thermostat if not open.	No No No No	Replace the thermistor with a new one. Replace IC4 (UPA2003C) with a new one. Replace P1 with a new one. Replace the heater with a new one or push the thermostat manual reset button..
C6	Open thermistor	1) Check the resistance across the thermistor if 100kilohms at room temperature of 25°C.	No Yes Yes Yes	Replace the thermistor with a new one. Contact failure RTH detect circuit failure Replace CPU with a new one.
E1	ICU ROM sum-check error	1) Check the ROM chip if correct.	No	Replace the ROM chip with a new one.
E2	ICU RAM read/write error	1) Check the RAM chip if correct.	No	Replace the RAM chip with a new one.

	Cause	Error description		Action
E3	Expansion memory read/write error	1) Check the expansion memory if correct.	No	Replace the expansion memory with a new one.
E4	ICU hardware error			Replace the ICU with a new one.
E5	ICU NVRAM sumcheck error	1) Check the NVRAM if correct.	No	Replace the NVRAM chip with a new one. Short pin J3 and initialize.

[12] Process control unit (PCU) circuit description

The PCU consists of the following circuits:

1. CPU peripheral circuit
2. ICU interface circuit
3. Print control peripheral circuit
4. OPU control circuit
5. Print process control circuit

BLOCK DIAGRAM

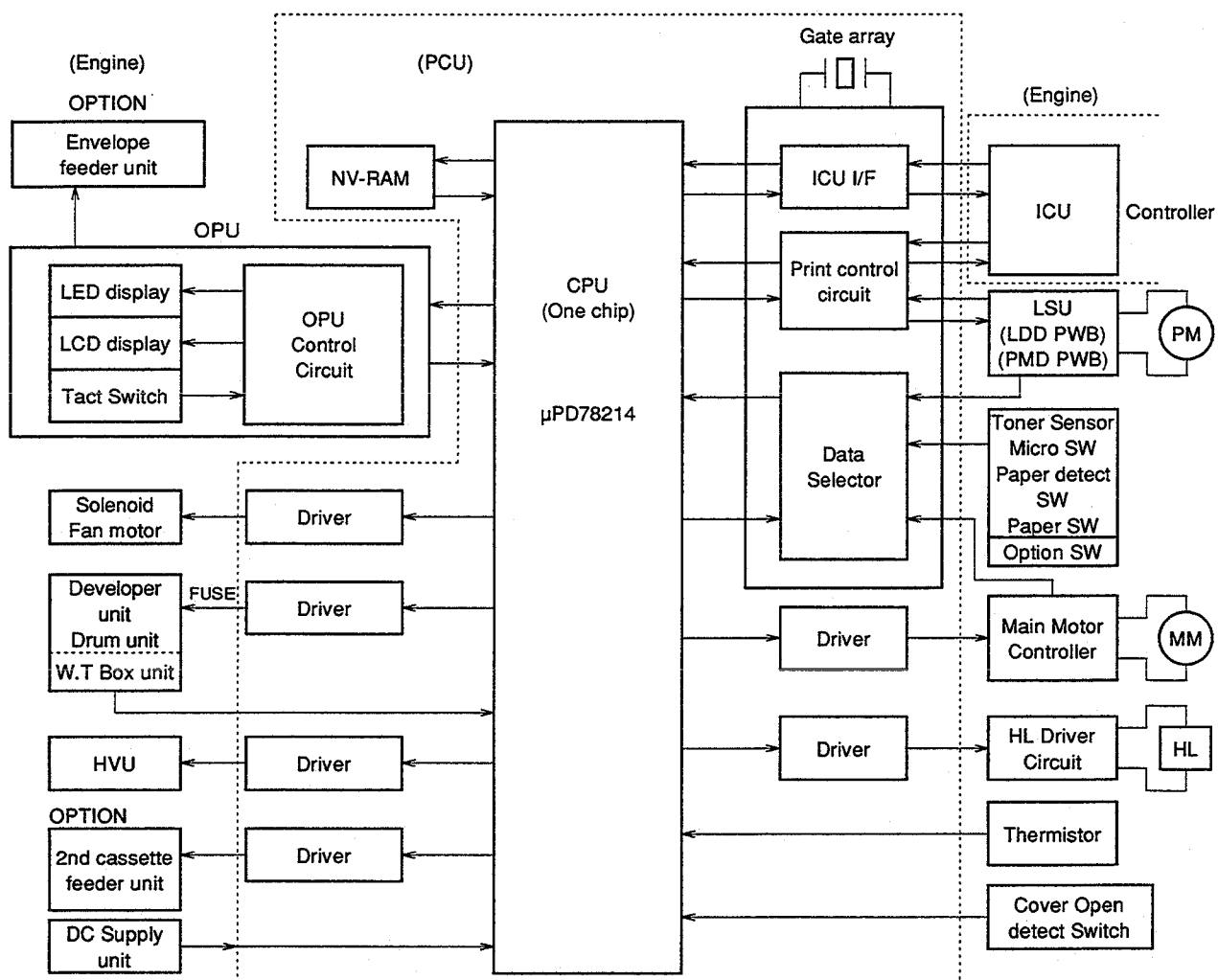


Fig. 1

Legend:-

LSU:	Laser scanning unit
PCU:	Process control unit
LDD PWB:	Laser diode drive printed wire board
PMD PWB:	Polygonal motor drive printed wire board
HL:	Heater lamp

OPU:	Operation unit
HVU:	High voltage unit
ICU:	Interface control unit

1. CPU peripheral circuit

The μ PD78214 used in the PCU is a single chip microcomputer, which includes program memory ROM and work RAM.

For data backup, data are loaded/stored from/to the NVRAM (Non-Volatile RAM) externally connected to the CPU when the power is turned ON/OFF.

1-1. CPU

The μ PD78214 is used to control the printer mechanism and to perform interface between ICU and OPU.

The μ PD78214 is an 8-bit single chip microcomputer including 16K byte mask ROM and 512 byte RAM, having 16bit timer/counter, 8bit timer counter, 2 channels of serial interface, 8 channels of 8bit A/D converter, and 54 I/O ports.

The CPU is used in the internal ROM mode.

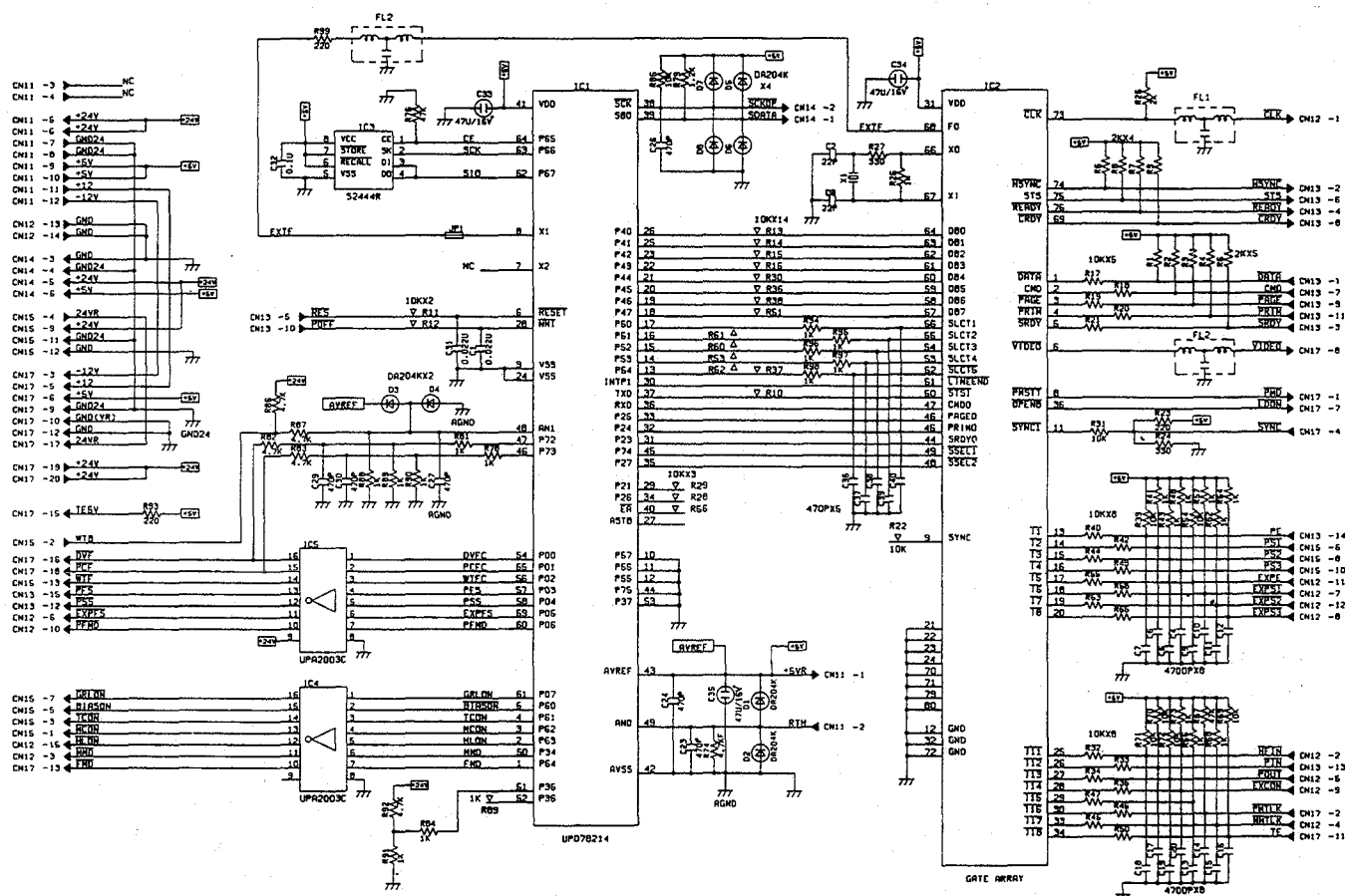


Fig. 2

CPU Terminal arrangement

Pin No.	In/Out	Signal name	Function
1	O	FMD	Fan motor control signal, H: Fan motor ON
2	O	HL ON	Heater lamp control signal, H: Heater lamp ON
3	O	MC ON	Main corona control signal, H: Main corona ON
4	O	TC ON	Transfer corona control signal, H: Transfer corona ON
5	O	BIASON	Bias control signal, L: Bias ON
6	I	RES	CPU reset signal
7	—	—	NC
8	I	EXTF	CPU clock input
9	—	GND	GND (0V)
10-12	—	—	GND
13	O	SLCT5	G/A internal select signal
14-17	O	SLCT4-1	G/A internal counter select signal /G/A input port select signal
18-23,	—	—	—
25-26	O	DB7-0	G/A internal counter set data signal /G/A internal control signal, interface signal with ICU
24	—	GND	GND (0V)
27	—	—	NC
28	I	POFF	Power OFF signal
29	—	—	Pull up
30	I	LINE END	Line end signal from G/A LSU control circuit
31	I	SRDY	Status ready signal from ICU
32	I	PRIM	Prime (Initialize request) signal from ICU

Pin No.	In/Out	Signal name	Function
33	I	PAGE	Print start signal from ICU
34	—	—	Pull up
35	I	SSEL2	Data input signal 2 from data selector in G/A
36	I	CMD	Command input signal from ICU
37	O	STS	Status output signal to ICU
38	O	SCKOP	Data clock signal to OPU
39	I/O	SDATA	Key input status from OPU/display data signal to OPU
40	—	—	Pull up
41	—	VDD	+5V
42	—	AGND	Analog port GND (0V)
43	—	AVREF	+5V
44	—	—	GND
45	I	SSEL1	Data input signal 1 from data selector in G/A
46	I	PCF	Drum unit fuse detect signal
47	I	DVF	DV unit fuse detect signal
48	I	WTB	Waste toner box detect signal
49	I	RTH	Thermistor input signal
50	O	MMD	Main motor control signal, H: Main motor ON
51	I	DOP	Cover open detect signal
52	—	—	Pull up
53	—	—	GND
54	O	DVFC	DV unit fuse cut signal, H: Fuse cut
55	O	PCFC	Drum unit fuse cut signal, H: Fuse cut
56	O	WTFC	Waste toner box fuse cut signal, H: Fuse cut
57	O	PFS	Paper feed solenoid control signal, H: PFS ON
58	O	PSS	Paper stopper solenoid control signal, H: PSS ON
59	O	EXPFS	Second cassette feeder PFS control signal, H: EXPFS ON
60	O	PFMD	Second cassette feeder motor control signal, H: PFM ON
61	O	GRLO	Screen grid bias control signal
62	I/O	SIO	Data signal to/from NVRAM
63	O	SCK	Clock signal to NVRM
64	O	CE	NVRAM chip enable signal

1-2. Non-volatile RAM (NVRAM)

The S2444R is a 256-bit non-volatile CMOS RAM which consists of 16 words x 16 bits. Data is transferred via single serial data bus.

Every bit of this RAM is backed up by an electrically erasable non-volatile memory (E2PROM). Data transfer between the RAM and the E2PROM takes place by a command from the processor, **STORE**, and **RECALL**. (In the case of the PCU, a command from the processor is used.)

While the non-volatile data is stored in the E2PROM, the RAM data is used for read and write. It does not require high voltage pulse and power supply, only a single +5V supply is required. All inputs and outputs are TTL compatible.

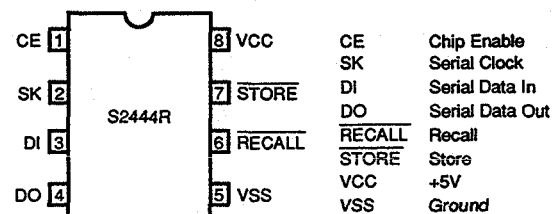


Fig. 4 Pin Configuration and Names

The NVRAM stores the following:

- (1) Life counter content
- (2) Top margin and left margin
- (3) Error content when power is turned off.

INSTRUCTION SET	
Instruction	Operation
WRDS	Reset Write Enable Latch (Disables writes and stores)
STO	Store RAM data in E2PROM
SLEEP	Enter SLEEP Mode
WRITE	Write Data into RAM Address AAAA
WREN	Set Write Enable Latch (Enables writes and stores)
RCL	Recall E2PROM Data into RAM
READ	Read Data from RAM Address AAAA

Table 1

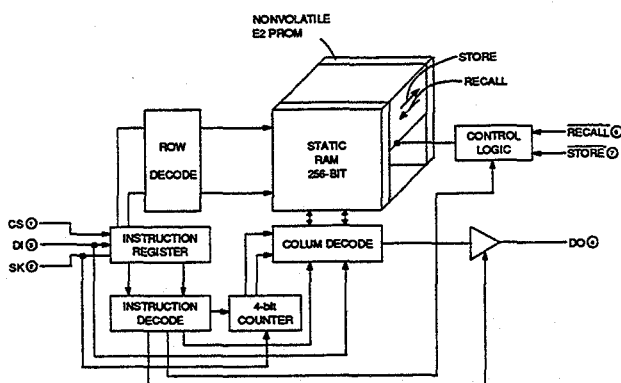


Fig. 3 S2444R (16X16) Block Diagram

(1) Recall

When recall is commanded, the data in the non-volatile E2PROM are transferred to the RAM.

(2) Store

When store is commanded, the data in the RAM is transferred in the E2PROM to revise the data within the E2PROM.

(3) Read/write memory

The RAM is accessed with a READ or WRITE command.

1-3. PCU power on/off sequence

The figure below shows the power on/off sequence of the CPU.

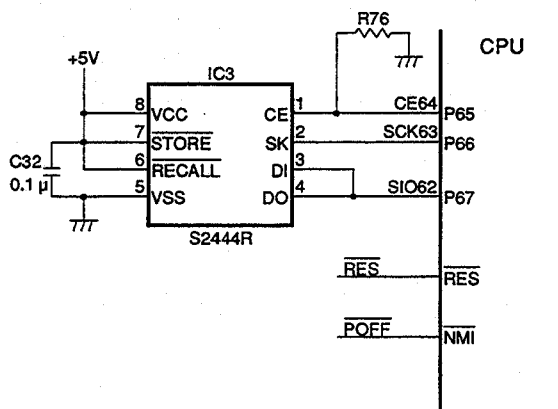


Fig. 5

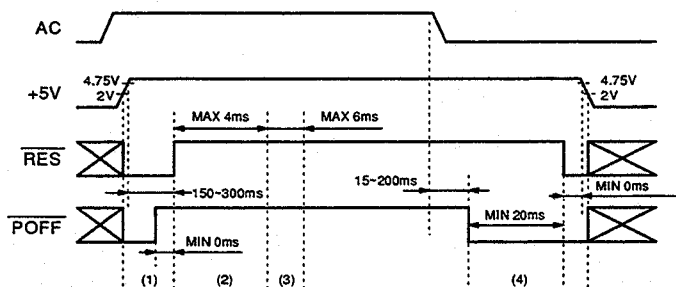


Fig. 6

- (1) After the AC power is turned on, both $\overline{RES}$ and $\overline{POFF}$ are set low for more than the prescribed period when the +5V line is above 2V.
- (2) After $\overline{RES}$ is reset to high, the CPU starts executing the program to perform a series of operations; initializing ports, checking ROM and RAM, clearing RAM, and a series of initialize operations.
- (3) After (2) has been completed, the CPU accesses the NV-RAM. With the execution of an RCL command, data within the E2PROM are transferred to the RAM in the NV-RAM. As a READ command is executed next, the RAM data in the NV-RAM are transferred to the work RAM within the CPU.
- (4) When the AC power is turned off, $\overline{POFF}$ is issued from the DC power supply and the CPU executes the non-maskable interrupt. The CPU turns off, loads and transfers the backup data to the NV-RAM in this interrupt. As the write command is executed, the data in the work RAM is transferred to the RAM in the NV-RAM. As the STO command is executed next, the RAM data in the NV-RAM are sent to the E2PROM in the NV-RAM to save the data against power off.

2. ICU interface circuit

The interface between the ICU and the PCU is called a video interface whose configuration is shown in Fig. 7. All signals are LS-TTL level and its I/O circuit is shown in Fig. 8.

The following are two kinds of video interfaces.

- (1) Serial interface
- (2) Single line signal

Figure 3.1 shows an outline of the interface signals.

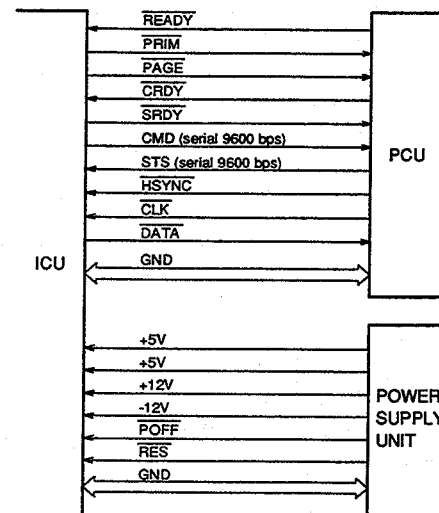
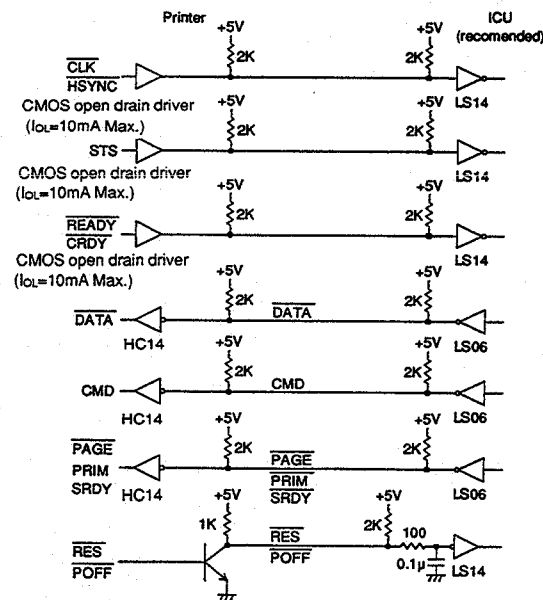


Fig. 3.1

3.1.3 VIDEO I/F Input/Output circuits



2-1. Serial interface

CMD and STS are the serial lines used to exchange control information between the PCU and the ICU.

The ICU requests the PCU to perform various operational and status information via the CMD line and OPU (operational unit) and printer engine related status information from the PCU via the STS line.

NOTES:

- (1) STS: Status line (from PCU to ICU)
- CMD: Command line (from ICU to CPU)

(2) Serial Interface Hardware Specifications

Baud rate: : 9600 bps

Character length : 8 bits

Start bit: : 1 bit

Stop bit: : 1 bit

Parity bit: : None

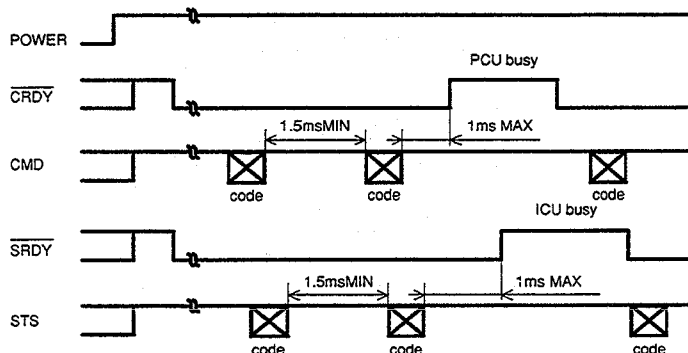
System: : Full duplex asynchronous

Serial interface of the PCU is performed by using the serial interface circuit included in the single chip CPU (uPD78210). CMD is processed in the interruption program routine after completion of reception of 1 byte signal by the PCU.

For ICU, transmission interval of two 1-byte codes must be min. 1.5 msec when transmitting control code or status code.

The PCU currently transmits and receives signals in 3msec interval.

Exchange timing of CMD and STS signals



Command table between the ICU and the PCU is shown below:

Table 2. Control code exchange procedures 1/3

CONTROL CODE		PROCEDURE			FUNCTION
HD*	NAME	ICU	LINE	PCU	
80+	SSA	80	→	80, STSA	Status Sense A. ICU reads status A from PCU.
81+	SSB	81	→	81, STSB	Status Sense B. ICU reads status B from PCU.
82+	SSC	82	→	82, STSC, STSD	Status Sense C, D. ICU reads status from PCU.
84	LEDR	84	→	84, LEDS	LED Status Read. ICU reads status of LED lights on control panel.
85	SWR	85	→	85, SW1S, SW2S	Switch Status Read. ICU reads status of switches on control panel.
86	PSZR	86	→	86, SIZE	Paper Size Read. ICU reads status of paper size.
87	LIFE1	87	→	87, X1, X2, X3	ICU reads remaining life counter of drum cartridge.

NOTE: X1, Y1, Z1 upper; X2, Y2, Z2 middle; X3, Y3, Z3 lower two digits

* : Control code in 2-digits hexadecimal number.

+ : Important control code.

LINE: → for CMD line, and ← for STS line.

Table 3. Control code exchange procedures 2/3

CONTROL CODE		PROCEDURE			FUNCTION
HD*	NAME	ICU	LINE	PCU	
88	LIFE2	88	→	88, Y1, Y2, Y3	ICU reads remaining life counter of developer cartridge.
89	LIFE3	89	→	89, Z1, Z2, Z3	ICU reads remaining life counter of printer.
8A+	LFOV	8A	→	8A, LIFE	Life over ICU read status of life over from PCU.
8B	OPSR	8B	→	8B, OPTION	Optional Status Read ICU reads status of optional products.
8F	ROMNO	8F	→	8F, ROMNO	PCU ROM Revision Number ICU reads the revision number of the PCU software.
90+	SWSCHG		←	90, SW1S, SW2S	Switch Status Changed. PCU sends switch status to ICU when there is a status change of switches on control panel.
92+	PEJCT		←	92	Paper eject. PCU sends status to ICU when paper is out on the output tray.
93+	PCUER		←	93	PCU Error. This code indicates error detected in PCU.
94	PCHSTD		←	94	Paper size change of the standard tray.
95	PCHOPT		←	95	Paper size change of the optional tray.
96	PGACK		←	96	Acknowledge of PAGE signal.
A1+	TRSELT	A1, TRAY	→		Paper Tray select PCU selects paper tray by TRAY.
A3	PMSTT	A3	→		Polygon Motor Start. Polygon motor is also started by PAGE signal.

NOTE: X1, Y1, Z1 upper; X2, Y2, Z2 middle; X3, Y3, Z3 lower two digits

* : Control code in 2-digits hexadecimal number.

+ : Important control code.

LINE: → for CMD line, and ← for STS line.

Table 4. Control code exchange procedures 3/3

CONTROL CODE		PROCEDURE			FUNCTION
HD*	NAME	ICU	LINE	PCU	
A4+	PERST	A4	→		PCU Error Reset. ICU resets PCU errors that are resettable.
A5	BUZZER	A5	→		Buzzer Buzzer beeps for 0.3sec.
A6	BZON	A6	→		Buzzer on Buzzer is beeping until A7 command is send.
A7	BZOFF	A7	→		Buzzer off
B0+	LEDON	B0,LEDS	→		LED Indicator On. PCU turns on LED lights according to LEDES.
B1	LEDBK	B1,LEDS	→		Operation Panel LED Blinking Start.
C1+	LCDCDP	C1,DDA, CGA	→		LCD Character Display. Character addressed by CGA in character generator is displayed on LCD cell addressed by DDA.
C2	LDCDBK	C2,DDA	→		LCD Character Blinking Start. Character on LCD cell addressed by DDA starts Blinking.
C3	LDCDBOF	C3,DDA	→		LCD Character blinking Stop. Character on LCD cell addressed by DDA stops Blinking.
C4	LCDDCL	C4	→		LCD Display Clear. All characters on LCD panel are cleared.
C5	LCDPOS	C5,DDA	→		LCD Positioning. ICU designates the position on LCD cell addressed by DDA.
C6	LCDCHR	C6,CGA1,CGA2,----- CGAn,NUL(00)	→		LCD Character strings ICU sends the character strings to LCD panel.

NOTE: X1, Y1, Z1 upper; X2, Y2, Z2 middle; X3, Y3, Z3 lower two digits

* : Control code in 2-digits hexadecimal number.

+ : Important control code.

LINE: → for CMD line, and ← for STS line.

Table 5. Status Codes, STSA to STSD

Bit	STSA, PCU Status	STSB, Operator Call	STSC, Hardware Error (1)	STSD, Hardware Error (2)	LIFE, Life over
D7	0	0	0	0	0
D6	Warm-up	Toner Empty	PCUROM Error	Optical Sys- tem Error	Drum Cartridge Life over
D5	Operator Call	Paper Empty	PCU RAM error	Main Motor Defective	Developer Cartridge Life over
D4	Hardware Error	PaperJam	NV-RAM Error	PignMotor Defective	Printer over
D3	0	Printer Open	Serial Commu- nication Error	Heater High Temper- ature	0
D2	Manual Feed SW ON	Waste Toner Box Change	0	Heater Low Tem- perature	0
D1	PCU Diagnostic test	0	0	Termistor open	0
D0	Life over	0	0	0	0

Logic One (1) for Set, and Logic Zero (0) for Reset.

Table 6. Status Codes: LEDES, and SW1S.

Bit	LEDES, LED Light Status	SW1S, Switch Status	SW2S, Switch Status
D7	0	FORM FEED	0
D6	READY	TEST PRINT	0
D5	MANUAL	MENU	0
D4	ONLINE	LINE	0
D3	DATA	△	0
D2	0	▽	0
D1	0	CONTINUE	0
D0	0	ENTER	0

Logic One (1) for switch ON or LED Light lit;
Logic Zero (0) for switch OFF or LED light OFF.

Table 7. Status Code: SIZE, TRAY

BIT	SIZE PAPER SIZE STATUS	TRAY TRAY SELECT STATUS	OPTION OPTIONAL STATUS
D7	INPUT TRAY PAPER CODE	0	0
D6		MANUAL FEED	0
D5		STANDARD TRAY	0
D4		OPTIONAL TRAY	OPTIONAL TRAY
D3	0	0	0
D2	0	0	0
D1	0	0	0
D0	0	ENVELOP FEEDER	ENVELOP FEEDER

PAPER CODE				SIZE
D7	D6	D5	D4	
0	0	0	0	NO TRAY
0	0	0	1	LEGAL
0	0	1	0	LETTER
0	0	1	1	INVOICE
0	1	0	0	—
0	1	0	1	A4
0	1	1	0	B5
0	1	1	1	EXECUTIVE

Table 8. Status Code, DDA

Cell No.	DDA*	Cell No.	DDA*
1	00	9	08
2	01	10	09
3	02	11	0A
4	03	12	0B
5	04	13	0C
6	05	14	0D
7	06	15	0E
8	07	16	0F

*: Status Code in 2-digits hexadecimal number.

1	2	3	14	15	16
---	---	---	----	----	----

LCD Cell No.

Table 9. Status Code, CGA and Display Character.

Upper 4bit Lower 4bit		0000	0010	0011	0100	0101	0110	0111	1010	1011	1100	1101	1110	1111
XXXX0000	CG RAM (1)													*
XXXX0001	(2)													*
XXXX0010	(3)													*
XXXX0011	(4)													*
XXXX0100	(5)													*
XXXX0101	(6)													*
XXXX0110	(7)													*
XXXX0111	(8)													*
XXXX1000	(1)													*
XXXX1001	(2)													*
XXXX1010	(3)													*
XXXX1011	(4)													*
XXXX1100	(5)													*
XXXX1101	(6)													*
XXXX1110	(7)													*
XXXX1111	(8)													*

*: Prohibition of Input

2-2. Single line signal

As mentioned STS and CMD are used to do serial signal transfer between the PCU and the ICU, but, the following single line signal is also used.

(1) Print control signals

SRDY

CRDY

READY

PRIM

(2) Print related signals

PAGE

HSYNC

CLK

DATA

Those are print related signals and will be discussed in more detail in Para 3-3, "Print control circuit".

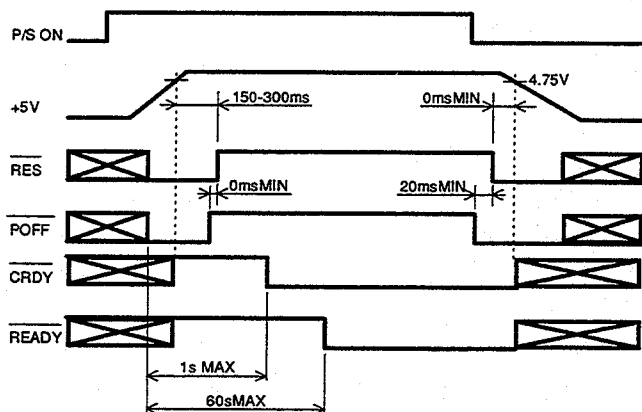
Table 7. Functions of interface signals

SIGNAL	DIRECTION	FUNCTION
READY	ICU ← PCU (Ready)	L for ready to print. H for warm-up, error detected or printer busy.
PRIM	ICU → PCU (Prime)	Initialize request to PCU. Active L state. When the printer is busy, this request is held until one page printing is completed.
PAGE	ICU → PCU (Page)	Print start request to PCU. It should be L during transmission of one pageful of data. When this signal is received and provided that there is no error, PCU will start operation.
HSYNC	ICU ← PCU (Horizontal Sync)	Sync signal for line-by-line printing. This signal indicates start timing of each line.
CLK	ICU ← PCU (Clock)	Synchronization clock for print video data receiving. ICU, after receiving an HSYNC pulse, sends video data in synchronization with this clock.
DATA	ICU → PCU (Data)	Print video data line. L level for black and H level for white. To be kept H after transmission of one line of data.
CMD	ICU → PCU (Command)	Command sending line to PCU. ICU sends various commands to PCU through this line.
STS	ICU ← PCU (Status)	Status sending line from PCU. ICU receives status information from PCU through this line.
SRDY	ICU → PCU (Status Ready)	L for ready to receive STS signal from the PCU. When this signal is H, STS signal is ignored.
CRDY	ICU ← PCU (Command Ready)	L for ready to receive CMD signal from the ICU. When this signal is H, CMD signal is ignored.

2-3. Descriptions on CRDY, READY, PRIM

Power-On Sequence and Initialize Request

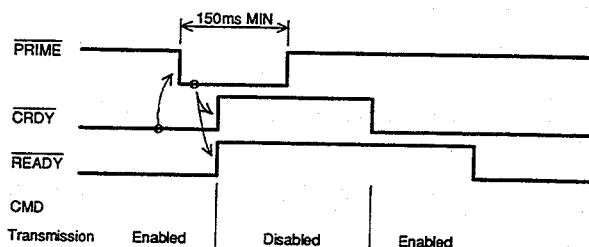
(1) Power ON sequence



When the power is turned ON, the circuit is initialized (RAM is cleared, etc.) and then CRDY is driven to LOW, displaying that the interface block between the ICU and PUC excepting the print process block is in ready state.

On the other hand, READY is driven to LOW when warming up of the heater is completed.

(2) Prime processing sequence



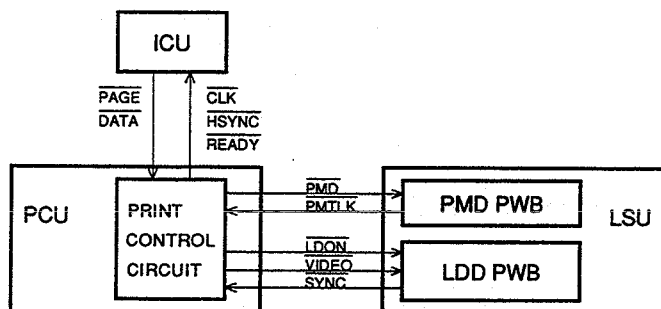
Sequence:

- (1) When the ICU confirms that CMD is not in transmission and that CRDY is at LOW, PRIM signal is transmitted to the PCU. (PRIM pulse width requires min. 150msec.)
- (2) After the PCU receives PRIM signal, CRDY signal and READY signal are driven to HIGH at timing when STS is not in transmission. (In this case, the PCU does not require to send STS which corresponds to the last CMD from the ICU.)
- (3) After the PCU initialize the circuit, it drives CRDY to LOW.
- (4) The PCU drives READY to LOW when the printing sequence ready state is obtained.

Note: 1. The PCU can receive PRIM signal only when CRDY signal is at LOW.

2. When PRIM signal is received during printing, circuit initialization is performed after completion of print cycle.

3. Print control peripheral circuit



- When the printer is ready for printing, the PCU supplies READY signal to the ICU.
- When the printer is ready (READY is at LOW), the print cycle is started by PAGE signal from the ICU.
- When the unit enters the print cycle, PMD signal is sent to the PMD (Polygon Motor Drive) PWB and PMTLK is outputted. The polygon motor reaches at a constant speed and the laser is lighted by LDON and VIDEO.
- The PCU sends HSYNC (which is made of SYNC from LDD PWB) and CLK (which is made in the print control circuit) to the ICU.
- The ICU sends DATA through synchronizing HSYNC and CLK.
- VIDEO is driven by DATA to turn on and off the laser.

3-1. LSU control signals

- (1) **LDON**
A low on this line causes the optical control circuit to activate.
- (2) **VIDEO**
A low on this line causes the laser diode to emit a beam.
- (3) **SYNC**
A Laser beam is detected at a high to low transition of this signal.
- (4) **PMD** (polygonal motor drive)
The polygonal motor starts with a low state of this signal and stops with a high state of the signal.
- (5) **PMTLK** (polygonal motor lock)
PLL sync complete signal.
Low: Sync rotation
High: Async rotation
It requires 6 seconds, max., before **PMTLK** becomes low after **PMD** is set low.

3-1-1. Laser diode drive PWB (LDD PWB)

Laser diode drive circuit block diagram

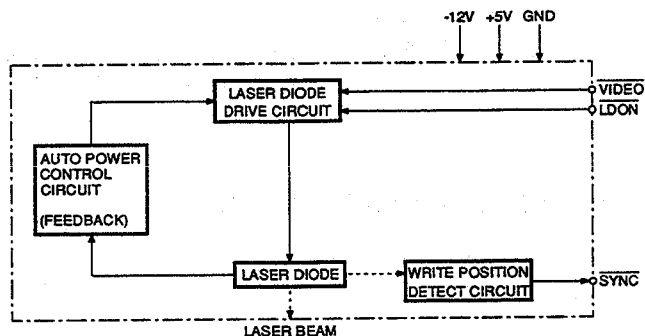
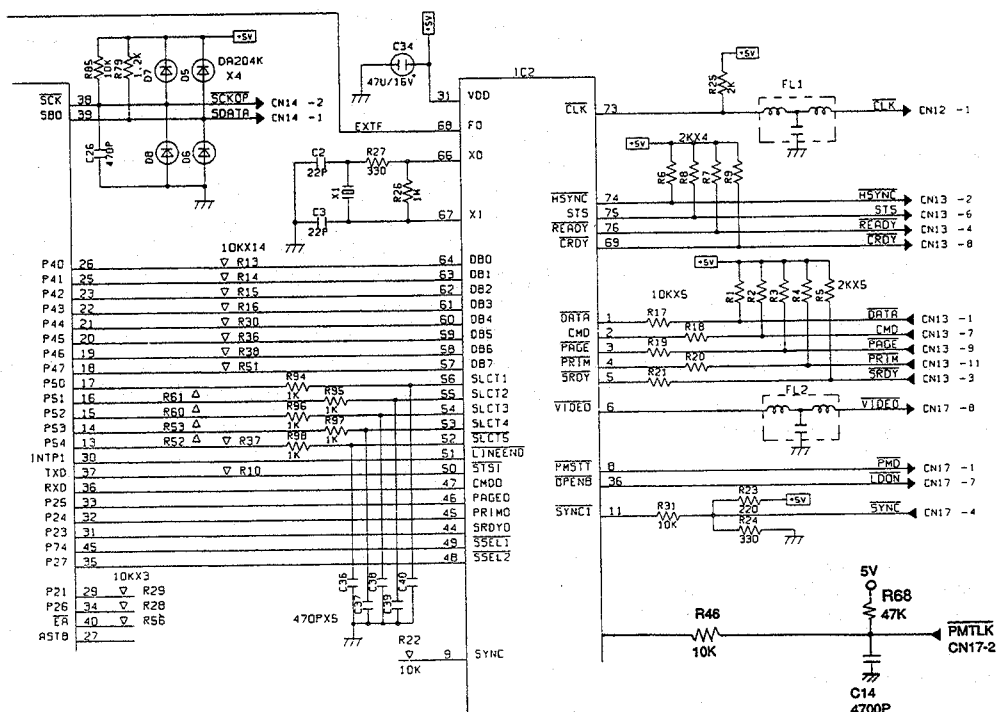
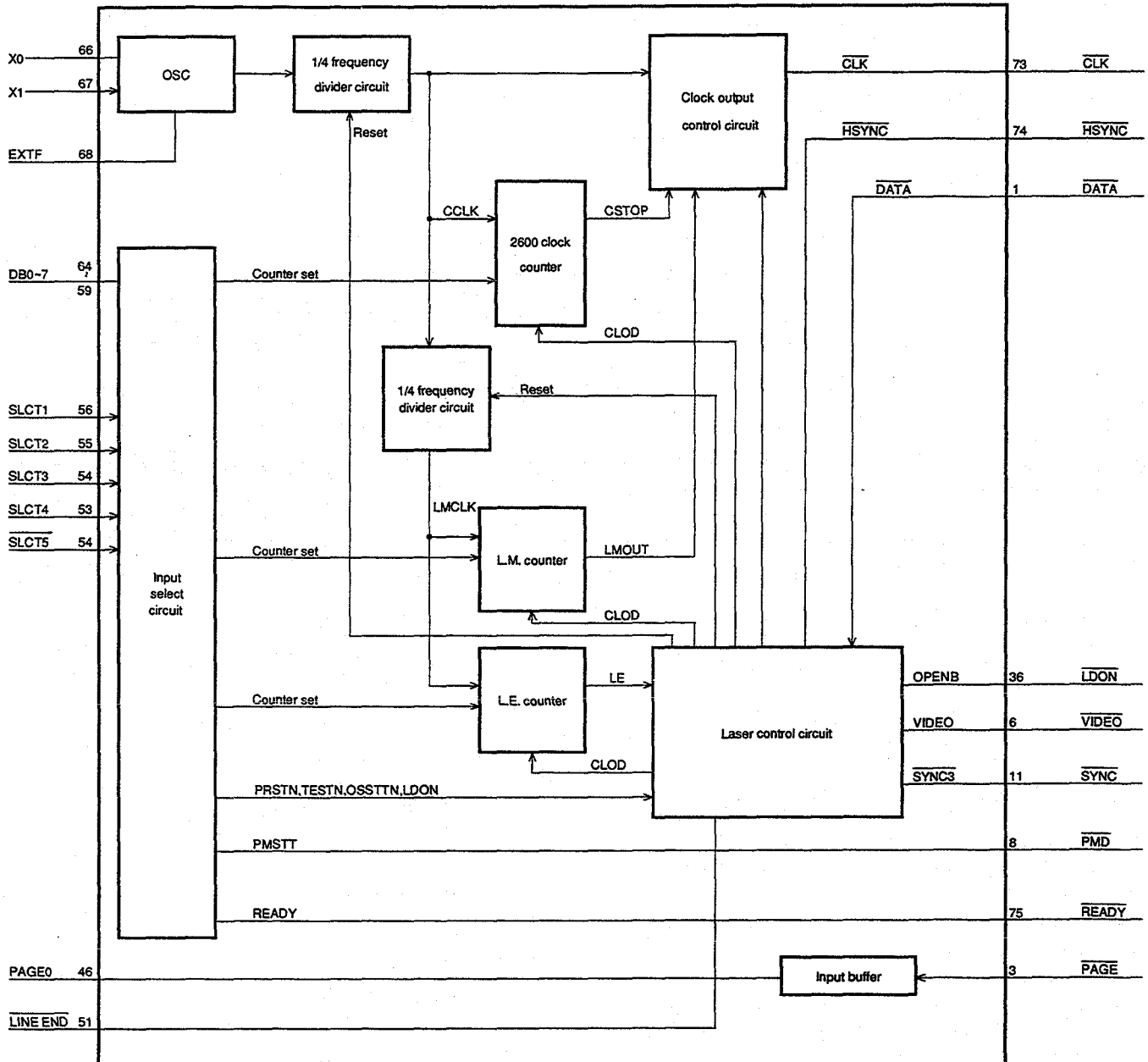


Fig. 15

3-2. Print control circuit



3-2-1. Gate array (LZ93M18)



Meaning of signals

XO, XI: XTAL connection terminal for the OSC circuit.
EXTF: CPU clock output signal.
DB0 ~ 7: Counter data, control signal. (See the table.)
SLCT1 ~ 4: Counter select signal, multiplexer input circuit select signal.
SLCT5: DB0 ~ 7 and SLCT1 ~ 4 select signal.
PAGE0: PAGE signal output for the CPU.
LINEEND: Signal for line end interruption for the CPU.
CLK: Clock output signal for the ICU.
HSYNC: HSYNC output signal for the ICU.
DATA: Data signal from the ICU, print data.
LDON: Laser ON APC start signal to the LDD PWB.
VIDEO: Laser ON/OFF signal to the LDD PWB. ON/OFF is controlled with print data.
PMD: Polygon motor drive signal.
READY: Printer ready signal to the ICU.

PAGE: Print start signal from the ICU.

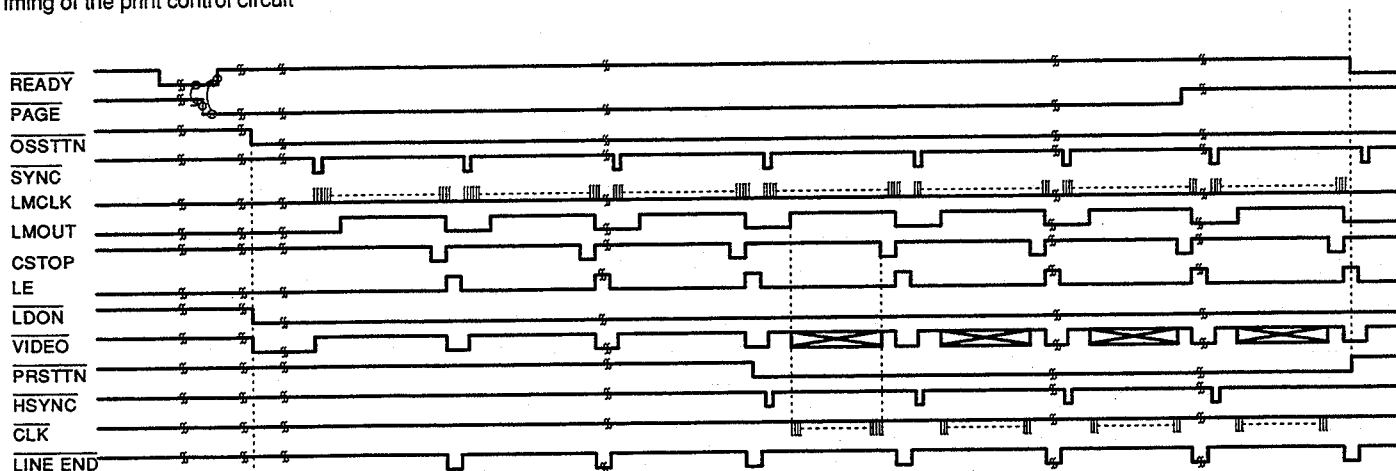
DB0 ~ 7

When SLCT5 is LOW:	
DB0	PRSTTN : Print start signal. Controls HSYNC and CLK to determine the top margin.
DB1	TESTN : Laser test ON signal. Turns on the laser only in the print area.
DB2	OSSTTN : G/A print control circuit drive signal.
DB3	LDON : Laser ON signal. Compulsorily turns on the laser.
DB4	READY : READY signal for the ICU.
DB5	CRDY : CRDY signal for the ICU.
DB6	PMSTT : PMD (Polygon Motor Drive) signal.
DB7	—

When $\overline{\text{SLCT5}}$ is HIGH, $\text{SLCT1} \sim \text{SLCT4}$ are 8 bit data for each counter setting.

SLCT1 is HIGH	Lower 1 byte of 2600 counter
SLCT2 is HIGH	Upper 1 byte of 2600 counter
SLCT3 is HIGH	1 byte of L.E. counter
SLCT4 is HIGH	1 byte of L.M. counter

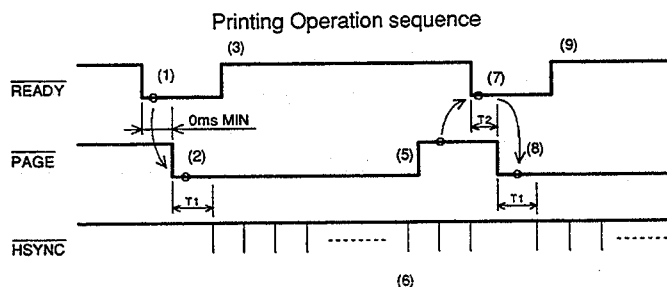
Timing of the print control circuit



- (1) When the printer engine enters the ready state, the PCU drives $\overline{\text{READY}}$ to LOW. When $\overline{\text{READY}}$ becomes LOW, if the ICU has completed print data processing, $\overline{\text{PAGE}}$ is driven to LOW and printing is started.
- (2) When $\overline{\text{PAGE}}$ becomes LOW, the PCU enters the print cycle to drive $\overline{\text{READY}}$ to HIGH and $\overline{\text{OSSTTN}}$ to LOW, driving the G/A print control circuit.
- (3) When $\overline{\text{OSSTTN}}$ becomes LOW, $\overline{\text{LDON}}$ also becomes LOW to turn on the laser drive circuit. Then $\overline{\text{VIDEO}}$ is supplied until the first $\overline{\text{SYNC}}$ is received, and the laser is lighted.
- (4) Synchronization is performed at the falling edge of $\overline{\text{SYNC}}$ and all the counters start.
- (5) The CPU is interrupted at the falling edge of $\overline{\text{LINEEND}}$ to perform line end interruption process.
 - a) Line number is counted to determine the top margin.
 - b) Timing to drive $\overline{\text{PRSTTN}}$ to LOW is made. By setting $\overline{\text{PRSTTN}}$ with line end interruption, $\overline{\text{CLK}}$ and $\overline{\text{HSYNC}}$ are supplied normally.
- (6) The clock frequency divided into 1/4 by the L.M. counter is counted to determine the left margin.
- (7) The 2600 counter counts 2600 clocks and sends $\overline{\text{CLK}}$ corresponding to 2600 dots to the ICU.
- (8) The L.E. counter generates count load timing for the L.M. counter and the 2600 counter, output timing of $\overline{\text{LINEEND}}$ signal, and the laser ON timing to obtain $\overline{\text{SYNC}}$.
- (9) Timing of $\overline{\text{CLK}}$ output to the ICU is formed by $\overline{\text{PRSTTN}}$, the L.M. counter, and the 2600 counter.

3-2-2. ICU-PCU interface

Data transfer between the ICU and the PCU takes place via the video interface. The ICU sends DATA to the PCU in sync with $\overline{\text{CLK}}$ received from the PCU.

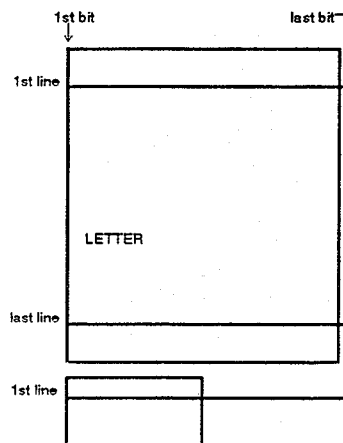
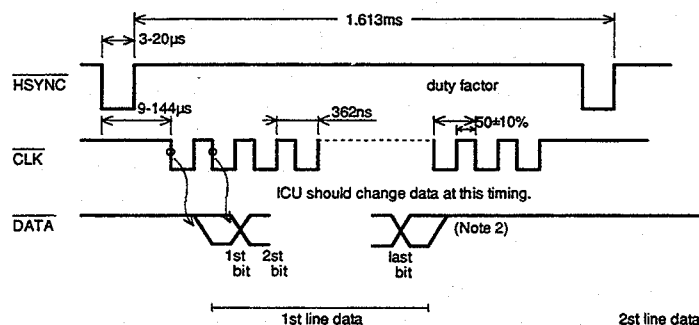


- (1) PCU is ready for printing.
- (2) Start request from ICU to PCU.
- (3) PCU, on receiving $\overline{\text{PAGE}}$, makes the mechanism start and turns $\overline{\text{READY}}$ to H (busy state).
- (4) PCU turns on the polygon motor and, after completing the preparatory process starts to send $\overline{\text{HSYNC}}$ pulses. (The time of T_1 for the first printing is changed depending on the processing condition)
- (5) ICU, after sending one page of data, turn $\overline{\text{PAGE}}$ to H. $\overline{\text{PAGE}}$ signal should remain low during the complete page printing time, PCU generates maximum 10 $\overline{\text{HSYNC}}$ pulses past $\overline{\text{PAGE}}$ goes high. The maximum number of $\overline{\text{HSYNC}}$ pulses is 6000 lines if $\overline{\text{PAGE}}$ has been low. Then PCU waits until $\overline{\text{PAGE}}$ goes high.
- (6) On completion of last line printing, printed copy is sent out.
- (7) Same as (1).
- (8) Start request from ICU to PCU.
In order to run the printer at its maximum speed, the time T_2 should be set within 0.5s. Otherwise the print speed will decrease.
- (9) Same as (3).

NOTE: The duration of the unstable $\overline{\text{PAGE}}$ pulse, which occurs when the controller power turns ON/OFF, should be 50ms at maximum.

In case that such duration is more than 50ms, PCU might recognize $\overline{\text{PAGE}}$ is effective.

VIDEO DATA TRANSMISSION TIMING CHART



- Note: 1. The number of CLK pulses is 2600 dots in each line.
 2. DATA to be H level (white) after sending the last bit of line data.
 3. Left edge of the paper is set as base line.
 4. The head CLK pulse in each line begin at the left of paper edge.

4. Operation PWB unit

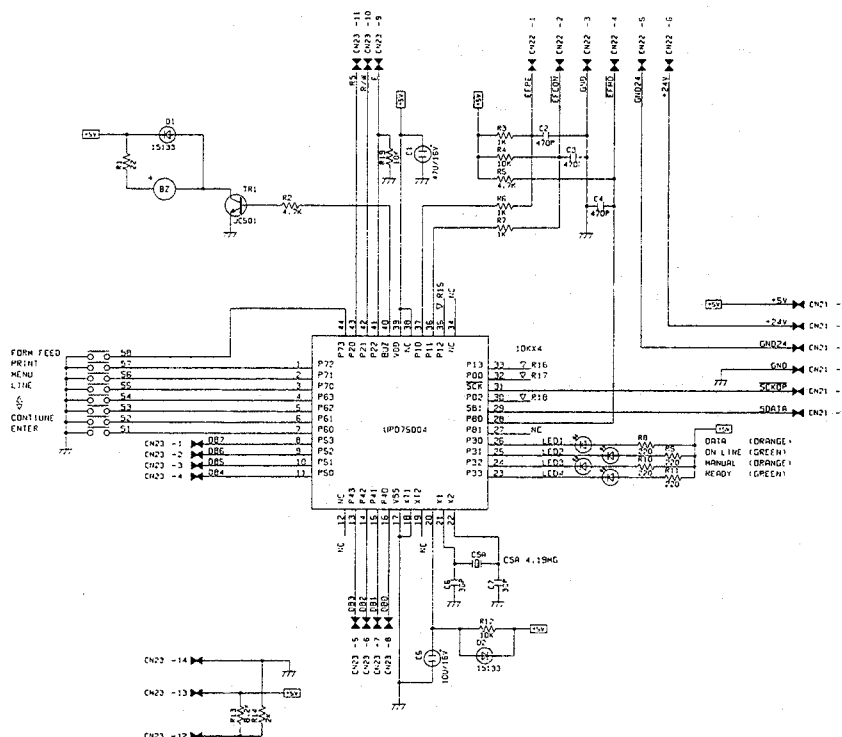
- The operation PWB unit controls the 16-digit, 1-line LCD display, four LED's, eight key switches, and the buzzer circuit by using the 4bit single chip CPU (μ PD75004).
- Between the 4bit CPU in the operation block and the 8 bit CPU in the PCU PWB, serial communications are performed to transmit key input, turn on and off the displays, and turn on and off the buzzer.

4-1. CPU

The CPU (μ PD75004) is a 4bit single chip microcomputer which performs detection of key input operations, LED display, LCD display (LCD driver control), buzzer on/off, and communication with 8bit CPU in the PCU.

It also controls the optional envelope feeder.

The μ PD75004 is a 4 bit, single chip microcomputer having 4K Byte mask ROM and 512 x 4 bit RAM, 2 channels of 8 bit timer, 1-channel clock timer (including the buzzer output) serial communication, and 34 I/O lines. Some I/O lines are used to directly drive LED's. The clock timer can provide 2kHz buzzer drive output.



Pin No.	In/Out	Signal name	Function
1	I	S7	Print key input
2	I	S6	Menu key input
3	I	S5	Line key input
4	I	S4	Δ key input
5	I	S3	▽ key input
6	I	S2	CONTINUE key input
7	I	S1	ENTER key input
8~16	I/O	DB7~DB0	Data lines to LCD driver
17	—	VSS	GND
18	—	XT1	GND
19	—	XT2	NC
20	I	RESET	CPU reset signal
21	—	X1	Clock oscillation circuit
22	—	X2	Clock oscillation circuit
23	O	LED4	Data LED
24	O	LED3	On line LED
25	O	LED2	Manual LED
26	O	LED1	Ready LED
27	—	NC	NC
28	O	EFMD	Envelope feeder motor drive signal (Option)
29	I/O	SDATA	erial communication data with 8 bit CPU
30	I	—	Pull up.
31	I	SCKOP	Serial clock input from 8 bit CPU
32	I	—	Pull up.
33	I	—	Pull up.
34	—	—	NC
35	I	—	Pull up.
36	I	EFCON	Envelope feeder connection signal (Option)
37	I	EFPE	Envelope feeder paper exhaust signal (Option)
38, 39	—	VDD	+5V
40	O	BU2	Buzzer ON signal
41	O	E	E signal of LCD driver
42	O	R/W	R/W signal of LCD driver
43	O	RS	RS signal of LCD driver
44	I	S8	Form feed key input

4-2. Key input

S1 to S8 are read statically to be transmitted to the PCU as serial data.

Port 6 and 7 are pulled up in the CPU. When the key is depressed, LOW level is acknowledged.

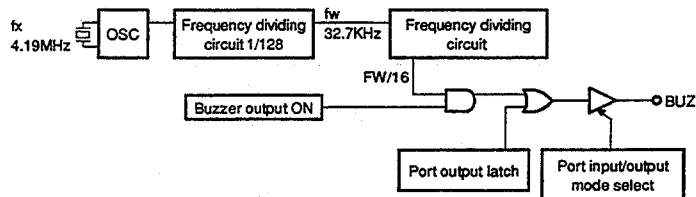
4-3. LED drive

The LED drive signals are used to light LED1 to LED4 according to the PCU command.

The LED's are statically driven and correspond to port 3, forming a pair. Port 3 is possible to drive directly the LED's.

4-4. Buzzer drive

The 2.046kHz signal formed in the clock timer circuit in the CPU is supplied to the buzzer terminal and used to drive the piezo-electric buzzer to make buzzer sounds.



4-5. LCD display sections

By sending command signals to the LCD controller/driver (HD44780) in the LCD display unit.

(Features)

1) The dot matrix type LCD panel in the display section and the CMOS-LSI in the drive section extremely reduce power consumption.

2) The thin display realized by integration of the LCD panel and the drive circuit in one PWB facilitates assembly into machines.

3) Connection can be made at general-use CMOS signal level. Therefore connection with a microcomputer having 4/8 bit common parallel input/output is easy.

4) The character generator ROM, RAM, and display data RAM are included.

Character generator ROM: 5 x 7 dot, 160 characters (Alphabets, Katakana)

Character generator RAM: 5 x 7 dot, 8 characters (Write is possible by the program.)

Display data RAM: 80 x 8 bit

5) Rich variations of instructions
Display clear, cursor home, display ON/OFF, cursor ON/OFF, display character blink, cursor shift, display shift

6) The automatic reset circuit is included which resets the circuit when the power is turned on.

7) LCD panel operates on 5V power stably in a wide range of temperatures.

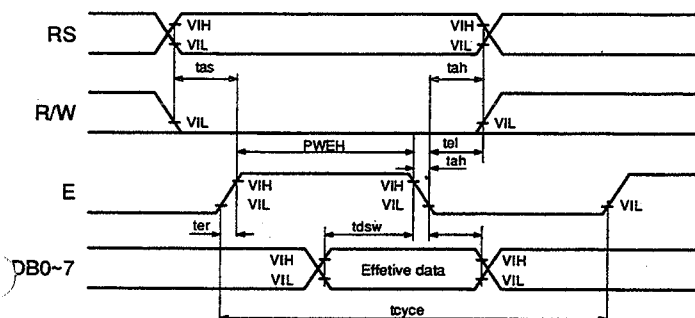
8) The visual angle is 12 o'clock visual angle.

(4-4) Terminal connection

Pin No.	Code	Content	Connection
14	V _{SS}	Ground potential	GND: 0V
13	V _{DD}	Logic circuit power	Supplies +5V.
12	V ₀	Contrast adjustment power	Adjusts contrast by supplying 0~5V.
11	RS	Register select	Control signal inputs (For details, refer to Chapters 6 and 7.)
10	R/W	Read/write	
9	E	Enable	
8	DB ₀	Data input/output LSB	Data bus line • DB ₇ is commonly used for busy flag output. • When connecting with a 4 bit parallel output microcomputer, DB ₀ to DB ₃ are not used. (For details, refer to Chapters 6 and 7.)
7	DB ₁	Data input/output 2nd bit	
6	DB ₂	Data input/output 3rd bit	
5	DB ₃	Data input/output 4th bit	
4	DB ₄	Data input/output 5th bit	
3	DB ₅	Data input/output 6th bit	
2	DB ₆	Data input/output 7th bit	
1	DB ₇	Data input/output MSB	

Table 5

Write operation



Read operation

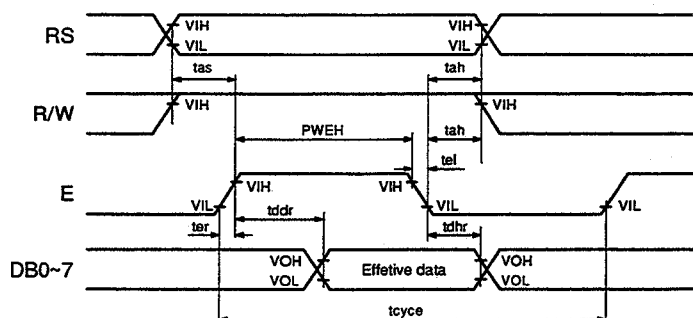


Fig. 1 Interface timing chart

4-6. Terminal descriptions**1) VDD and VSS terminals**

V_{DD} and V_{SS} are power supply terminals. V_{SS} is grounded and V_{DD} receives +5V.

The voltages required for LCD drive are generated in the unit.

2) RS terminal

The control LSI has two 8-bit registers: the instruction register (IR) and the data register (DR). RS terminal is used to select one of these registers.

The IR is used to store instruction codes (such as display clear and shift) and address information of the display data RAM (DDRAM) and the character generator RAM (CGRAM). The DR is used to temporarily store data which are written into DDRAM and CGRAM.

"0": Instruction register (When writing)

Busy flag register, address counter (When reading)

"1": Data register (When reading/writing)

3) R/W terminal

The select signal of READ and WRITE.

"0": WRITE

"1": READ

4) E terminal

Operation start signal which starts data reading or writing.

5) DB₀~DB₇ terminals

Tri-state, bi-directional data bus. Data communication with an external circuit is performed through this bus.

DB₇ is commonly used for busy flag output. When connecting with a 4-bit parallel output microcomputer, DB₀~DB₃ are not used.

6) V₀ terminal

Power terminal for the liquid crystal drive circuit. By changing voltage input from 0V to 5V, visual angle and contrast are controlled.

4-7. Instruction descriptions

Table 7

Instruction	Code										Description
	RS	R/W	DB ₇	DB ₆	DB ₅	DB ₄	DB ₃	DB ₂	DB ₁	DB ₀	
Display clear	0	0	0	0	0	0	0	0	0	1	All displays are cleared and the cursor returns to home position (address 0).
Cursor home	0	0	0	0	0	0	0	0	1	*	The cursor returns to home position (address 0). Shifted display also returns to its original position. DDRAM contents are not changed.
Entry mode set	0	0	0	0	0	0	0	1	I/D	S	Setting of cursor direction or display shift. The operation is performed during data read/write.
Display on/off control	0	0	0	0	0	0	1	D	C	B	Setting of display on/off (D), cursor on/off (C), blinking of character at cursor position (B).
Cursor/display shift	0	0	0	0	0	1	S/C	R/L	*	*	Without changing DDRAM contents, the cursor is moved and display is shifted.
Function set	0	0	0	0	1	DL	1	O	*	*	Setting of interface data length (DL).
CGRAM address set	0	0	0	1	ACG						Setting of CGRAM address (ACG). After that, communication data are CGRAM data.
DDRAM address set	0	0	1	Add						Setting of DDRAM address (ADD). After that, communication data are DDRAM data.	
Busy flag address read	0	1	BF	AC						Reading of busy flag (BF) which shows internal operation and address counter (AC).	
CGRAM/DDRAM data write	1	0	WRITE				DATA				Writing data into DDRAM or CGRAM.
CGRAM/DDRAM data read	1	1	READ				DATA				Reading data from DDRAM or CGRAM.
I/D = 1: Increment, I/D = 0: Decrement, S/C= 1: Display shift, S/C = 0: Cursor move, S = 1: Display shift, S = 0: Display fixed, R/L = 1: Right shift, R/L = 0: Left shift, D = 1: Display on, D = 0: Display off, DL = 1: 8 bit, DL = 0: 4 bit, C = 1: Cursor on, C = 0: Cursor off, BF = 1: Internal operation, BF = 0: Internal operation end, B = 1: Cursor position character blinking, B = 0: Cursor position character not blinking											

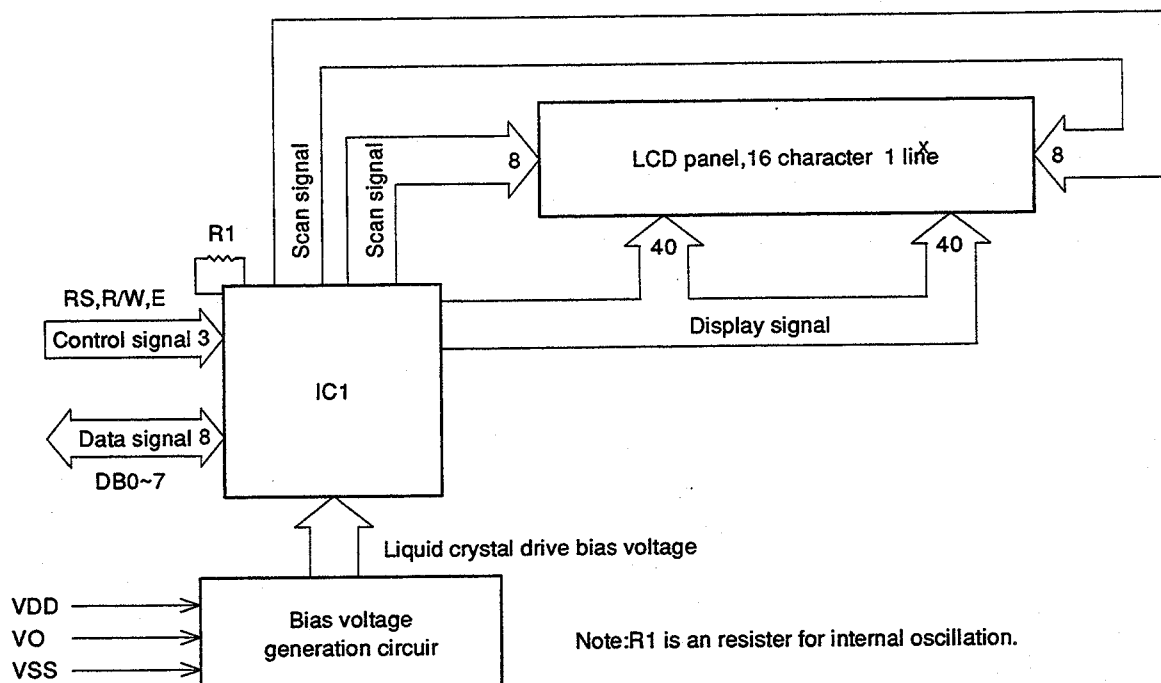


Fig. 5. circuit configuration

4-8. Envelope feeder control (Option)

The envelope feeder motor (option) on/off control is performed with commands from the PCU. The status of the envelope feeder is set to the PCU.

CN22 terminal function

Terminal No.	Signal name	Function
1	EFPE	Envelope feeder paper empty, HIGH active. When the envelope feeder has no paper in it, HIGH level. Detects presence of paper.
2	EFCON	Envelope feeder connection. LOW active. When the envelope feeder is installed, LOW level. Detects presence of envelope feeder.
3	GND	Signal GND
4	EFMD	Envelope feeder motor drive, LOW active. When LOW, the envelope feeder motor is ON.
5	GND24	24 line GND
6	+24V	+24V motor power

5. Print process control circuit

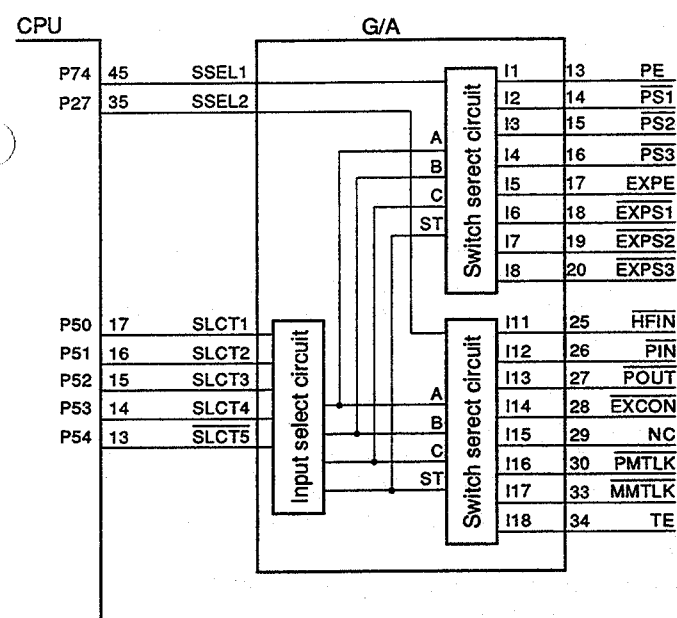
The printer state is detected by the input circuit to control each block, performing printing operation.

- (1) Engine status input circuit
- (2) Heater lamp control circuit
- (3) High voltage unit, main motor, fan motor, solenoid drive circuit
- (4) Second cassette feeder unit (option) control circuit

5-1. Engine status input circuit

Signals of +24V (cover open) detection, WTB, DVF, and PCF are directly sent to the CPU. The other signals are selected by G/A LZ93M18 and sent to the CPU as signals of SSEL1 or SSEL2.

5-1-1. Gate array (LZ93M18) status input circuit



Switch select circuits 1 and 2 are equivalent to HC151. Through selection of A, B, and C, I11-I18 (I11-I18) of the input circuit are changed over, and supplied as SSEL1 (SSEL2) when ST is at LOW level.

Select signal correspondence is: A=SLCT1, B=SLCT2, C=SLCT3. When SLCT5 is low, ST is low to supply data.

SLCT5	SLCT1	SLCT2	SLCT3	SSEL1	SSEL2
0	0	0	0	PE	HFIN
	1	0	0	PS1	PIN
	0	1	0	PS2	POUT
	1	1	0	PS3	EXCON
	0	0	1	EXPE	—
	1	0	1	EXPS1	PMTLK
	0	1	1	EXPS2	MMTLK
	1	1	1	EXPS3	TE
1	X	X	X	L	L

PE: High when no paper in the cassette. Sensor output.

PS1-3: Paper size detect sensor output. When each switch is turned on, the correspondence paper size is detected.

EXPE: Optional second cassette/feeder paper detection sensor output. High when no paper in the cassette.

EXPS1-3: Optional second cassette/feeder paper size detection sensor output. Same operation as PS1-3.

HFIN: Manual input switch. Low when there is paper in the manual input section.

PIN: Paper-in detection switch. Low when paper is detected in the machine (in front of PS roller.)

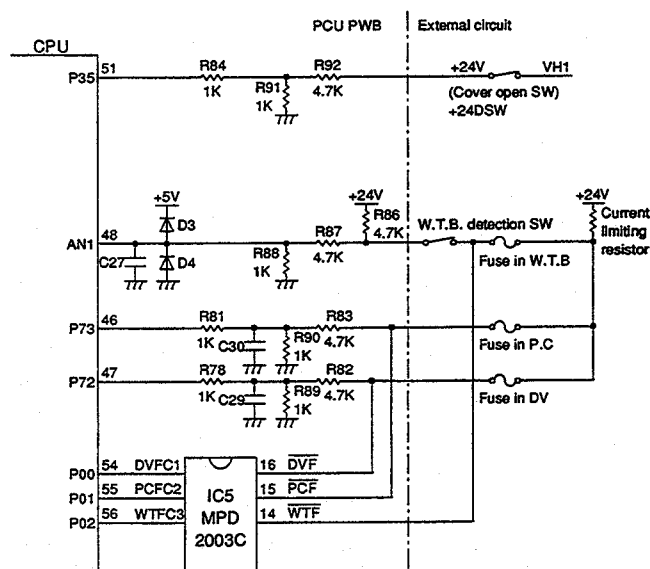
POUT: Paper-out detection switch. Low when paper is detected in the machine (in the paper-out section.)

EXCON: Second cassette feeder connection detection signal. Low when optional second cassette feeder is connected.

PMTLK: Polygon motor lock signal. Low when it is detected that the polygon motor reaches a constant speed. (Output from the PLL circuit)

MMTLK: Main motor lock signal. Low when it is detected that the main motor reaches a constant speed. (Output from the PLL circuit)

TE: Toner empty signal. Low when there is toner. High or turning to LOW at every 2 seconds, there is no toner or no DV unit.



5-1-2. Cover open detection

When the cover is opened, the safety switch (+24V DSW, cover open SW) is turned off to stop supplying +24V. Then port 35 of the CPU is driven to low level, detecting cover open.

5-1-3. Waste toner box (W.T.B.) detection

① W.T.B. detection

When W.T.B. is installed, W.T.B. switch is turned on. When $\overline{WTF}$ is driven to low then AN1 voltage becomes about 0V. When there is no W.T.B. installed, W.T.B. switch is off and $\overline{WTF}$ is low. Voltage at AN1 is about 2.3V because +24V is divided by R86, R87, and R88.

② W.T.B. new/old detection

When W.T.B. is new, voltage at AN1 is about 4V (by dividing with R87 and R88). Because the fuse in new W.T.B. is not blown off. For old W.T.B., fuse is blown off, and voltage at AN1 is about 2.3V because 24V is divided by R86, R87, and R88.

By combination of ① and ②, presence of waste toner box and its new/old are detected.

When a new waste toner box is installed, WTF is driven to low in about 1 sec, blowing off the fuse.

5-1-4. PC, DV old/new detection

When a new unit is installed, port 72 and port 73 are driven to high. The fuse in each unit is not blown off. Because DVF or PCF is driven to low for about 1 sec to cut the fuse.

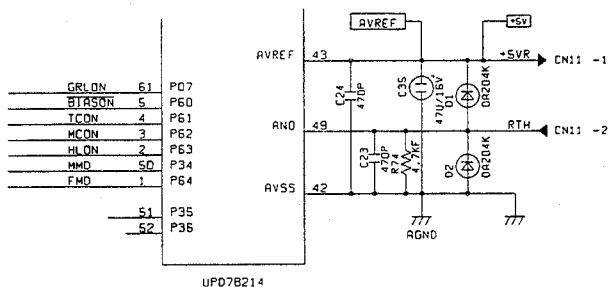
Since the fuse in an old unit is blown off, port 72 or port 73 becomes low. Thus judgement is made.

When each unit life is over, if a new unit is installed, the life counter is automatically cleared.

Even when life is not over, if a new unit is installed, the life counter is cleared and the fuse is blown off.

5-2. Heater lamp control circuit

Voltage divided by the thermistor attached to the fuser roller surface, R74, (4.7kF) is applied to AN0 port to detect the fuser roller surface temperature and turn on/off HLON signal, controlling the heater lamp. Heater temperature control, high temperature error, low temperature error, thermistor open, thermistor short are all performed by the CPU.



5-3. High voltage unit (HVV)

Consists of the MC circuit, TC circuit, bias circuit, and grid circuit; each one having the following assignment.

MC circuit: High voltage is added to the main corona unit to charge the drum surface.

TC circuit: High voltage is added to the transfer corona unit to transfer the toner on the drum surface to the copy paper.

Bias circuit: Charges carrier within the developer cartridge.

Grid circuit: Used to stabilize the potential on the drum surface by controlling the scorotron charge device.

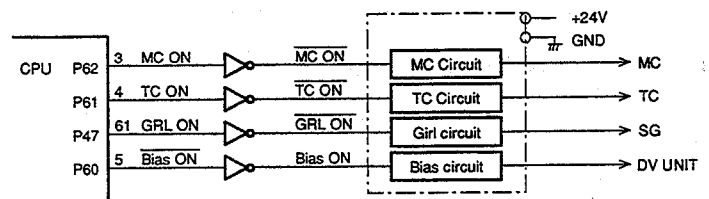
A screen grid is provided between the main corona wire and the photoconductor, and the constant voltage is added to the grid to distribute the corona current to the photoconductor and the grid. As the surface potential of the photoconductor increases by corona charge, the current flowing through the grid increases. As the

photoconductor potential reaches the grid potential, the entire current flows to the grid so that the photoconductor potential is maintained at the given level at all times.

(Interface with PCU)

Control signal	
MHVON	Output is active when the control signal is below 2V.
THVON	Output is not active when the control signal is open.
BIASON	Output is active when the control signal is open.
	Output is not active when the control signal is below 2V.
GRLON	Output is high when the control signal is open.
	Output is low when the control signal is below 2V.

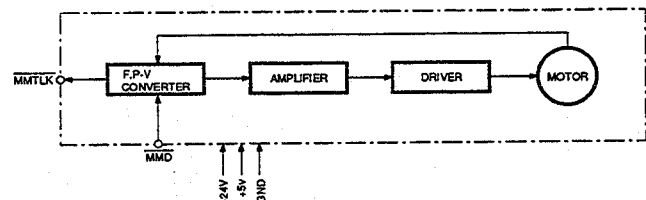
- The DV bias voltage is generated by dividing a voltage generated at the screen grid by the main corona. Therefore, when the main corona is not turned on (when there is no voltage at the screen grid), the DV bias is not generated.



5-4. Main motor controller

Used to control start and stop of the main motor with $\overline{MMD}$ from the PCU and to maintain the motor revolutions as determined.

MAIN MOTOR CONTROL CIRCUIT BLOCK DIAGRAM



MMD: The motor starts to run when $\overline{MMD}$ is set low.

MMTLK: When the motor revolutions go out of the speed setting ($\pm 5\%$), the output signal is set high to inform of an abnormal condition.

5-5. Second cassette feeder (option) control circuit

This circuit performs on/off control of the paper feed motor and paper feed solenoid in the second cassette feeder (option), and input for the paper empty detection switch and the paper size detection switch.

The connector is Pin D sub attached to the rear of the DC power PWB.

EXPFS: Second cassette feeder paper feed solenoid ON signal. Low when ON.

PFMD: Second cassette feeder motor ON signal

When the second cassette feeder is selected, if print start $\overline{PAGE}$ signal is supplied, PFMD is driven to low to rotate the second cassette feeder motor. The EXPFS is turned on for 0.5sec to rotate the pick up roller, feeding paper.

6. Print sequence control

Print Sequence Control

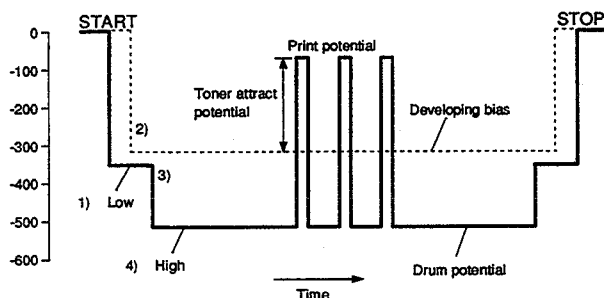
The CPU (PCU) controls the ICU and the printer engine sequence with signals from the ICU and the printer engine.

The laser printer process control is composed of the charging process control for forming latent image on the OPC drum, the developing process control for developing based on the latent image, and the transfer process control for transfer of the developed, visible image from the OPC drum surface to paper.

The basic process control is shown in the following:

Voltage added to the screen grid can be selected, high and low.

To make it easily understood, the figure below shows voltage transition at the developer unit.



Start

- 1) Because the grid potential is at a low level, the drum potential is at low level. (Carrier may not be attracted though the carrier is pulled towards the drum by the electrostatic force.)
- 2) Developing bias is added when the drum potential is at a low level.
- 3) Even if the developing bias voltage is added, toner deposit will not occur because the bias voltage is higher than the drum potential.
- 4) After the developing bias is added, the grid voltage changed from low to high, but the toner and developer may not be attracted because the drum potential is at high level.

Stop

- 1) After completion of printing, more than one turn of the OPC drum is uniformly charged at high level.
- 2) Only the portion uniformly charged at high level is adversely charged to low level by the transfer corona.
- 3) When the portion discharged by the transfer corona passes the main corona section, the grid voltage is changed over to LOW output.
- 4) When the LOW grid voltage output area on the OPC drum passes the developer section, the developing bias is turned off.
- 5) The OPC drum is optically discharged more than one turn by the semiconductor laser and is stopped.

Retaining developing bias at an abnormal occurrence

Function

The developing bias will be lost if the power supply was shut off during printing due to a power supply failure. In this event, the drum potential slightly abates and the carrier makes deposits on the drum because of strong static power. To prevent this, the machine incorporates the function to retain the developing bias for a certain period against a possible power supply failure.

Basic function

Normally, the developing bias voltage is retained for a certain time before the drum comes to a complete stop, if the machine should stop before completing the normal print cycle. In this way, the developing bias can be added before resuming the operation after an abnormal interruption. No carrier will therefore make a deposit on the drum surface.

6-1. Forward revolution timing

Before starting image formation process, forward revolution cycle is performed to initialize the OPC drum state. The process control differs depending on the previous process completion conditions: normal completion or abnormal completion.

Abnormal completion means the following two cases:

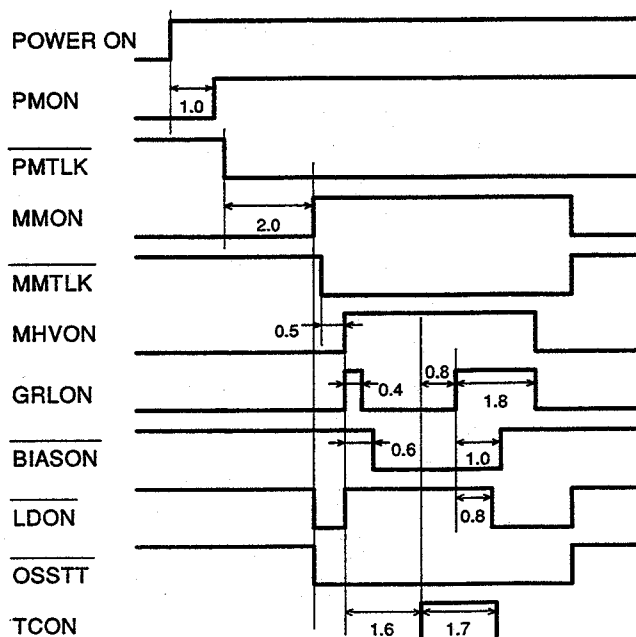
- (1) When Any error other than toner empty, life over, and paper empty occurs during the main motor is ON.
- (2) When the power is turned off during the main motor is ON.

The forward revolution cycle is performed in the following three cases:

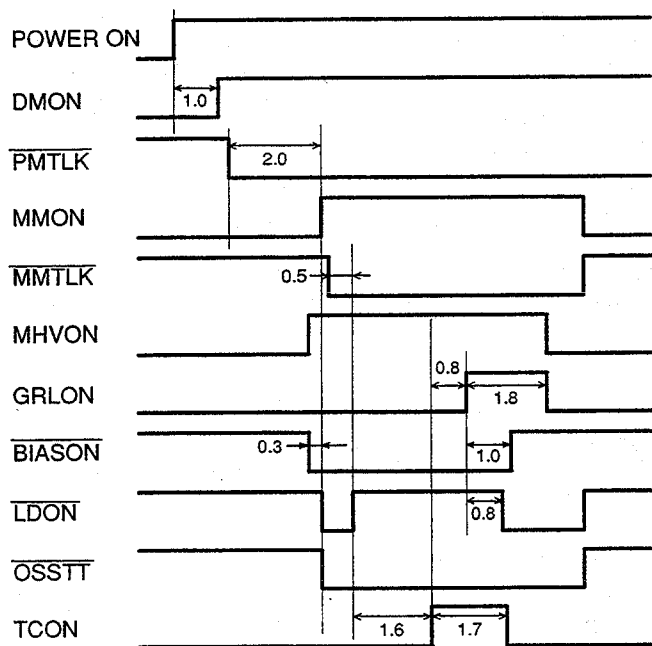
- (1) When the power is turned on. (Except in the diagnostic mode.)
- (2) When resetting from an error state. ("A4" (error reset) command from the controller)
- (3) When restarting after an interval of more than 3 minutes.

The timing chart of normal completion and abnormal completion is shown below:

6-1-1. After normal termination



6-1-2. After abnormal termination



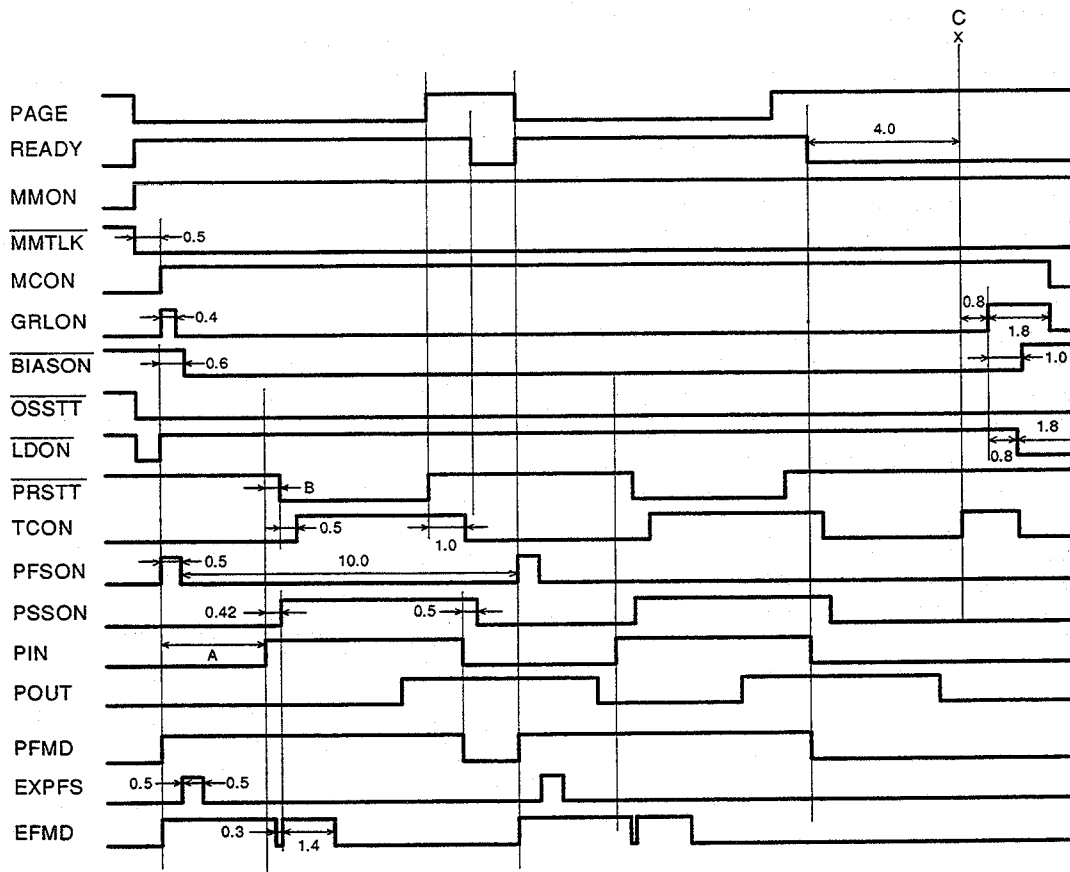
6-2. Print cycle timing

When the PAGE signal is issued from the ICU with the print engine in the ready state, the print engine goes into the print cycle.

The print ready state is established when the following conditions are met.

- (1) The outset cycle must have been completed.
- (2) Warmup must have been completed. Warmup will be complete at the moment the heater roller temperature reached 165°C (175°C Manual feed) after the start of the outset cycle.
- (3) No error was met.

6-2-1. Print cycle timing chart (Printing two A4 papers)



A: Time varies according to cassettes.

B: Top margin value (ø: 103 line, 50: 253 line, 99: 400 line)

C: Print end cycle start point

6-3. Print cycle completion timing when an error occurs

When one of the following errors occurs during print cycle, the signals other than BIASON and MHVON are immediately turned off. (Fig. 52)

Error code: PJ, d0, C1 ~ C6

In this case, immediately after MHVON signal is turned off, the OPC drum potential is at HIGH. When BIASON and MHVON signals are turned off simultaneously, the OPC drum revolution causes carrier drop. To prevent this, BIASON signal and MHVON signal are retained by the CPU until the OPC drum revolution completely stops (for 0.2 sec after MMD is turned to HIGH.)

When the power is turned off during print cycle, carrier drop failure occurs for the same reason as above. In this case, BIASON and MHVON cannot be retained by the CPU. Therefore, developing bias voltage is retained.

In the case of Pout error, normal completion cycle is performed immediately after occurrence of the error.

6-4. Error detect specification

The error judgement criteria for the printer engine (excepting the ICU) are shown below:

(1) Paper jam

1. When Pin SW does not turn on within 4.0 sec after the envelope motor is turned on.
2. When Pin SW does not turn on within 2.3 sec after the standard PFS is turned on.
3. When Pin SW does not turn on within 3.3 sec after the option (second cassette) PFS is turned on.
4. When Pin SW does not turn off within 8 sec after the PSS is turned on.
5. When Pout SW does not turn on in 4 sec after the PSS is turned on.
6. When Pout SW does not turn on in 4 sec after Pin SW is turned off.
7. When Pout SW is on in other than print cycle.
8. When Pin SW is on and HFSW is off in other than print cycle

(2) Paper empty

There is no paper in the selected cassette.

(3) Toner empty

1. When TE signal is detected for 10 sec continuously during the main motor revolution.

(4) Cover open

When the +24V SW is off.

(5) Waste toner box change

1. When waste toner box is not installed.
2. The waste toner box fuse is not blown off in 1 sec.
3. When new waste toner box is not installed on resetting from the toner empty.

(6) OPC life over (Drum cartridge)

1. When the life counter shows zero.
2. When the life counter shows below zero when the power is turned on.
3. When the life counter exceeds -5000.
4. When the cartridge fuse is not blown off in 1 sec.

(7) DV life over

1. When the life counter shows zero.
2. When the life counter shows below zero when the power is turned on.
3. When the life counter exceeds -3000.
4. When the cartridge fuse is not blown off in 1 sec.

(8) Printer life over

1. When the life counter shows zero.
2. When the life counter shows below zero when the power is turned on.

(9) P1 (PCU ROM error)

When the PCU ROM check error occurs after turning on the power.

(10) P2 (PCU RAM error)

When the PCU RAM read/write check error occurs after turning on the power.

(11) P3 (NVRAM error)

When the NVRAM sum check error occurs after turning on the power.

(12) P4 (Serial communication error)

When the overrun error or the framing error occurs when the PCU is receiving CMD from the ICU.

(13) C1 error (Optical system error)

1. When SYNC is not detected within 0.5~1.0 sec after issuing the optical system print start signal (OSSTT).
2. When SYNC is not detected by checking at every 0.5 sec after the timing of the above.

(14) C2 error (Main motor error)

1. When MMTLK signal is not at LOW after 1.0~1.5 sec after MMON signal is turned on.
2. When five continuous MMTLK signals are detected by sampling at every 0.5 sec after the timing of the above.

(15) C3 error (Polygon motor error)

1. When PMTLK signal is not at LOW after 6.0~6.5 sec after PMON signal is driven to HIGH.
2. When five continuous PMTLK signals are detected by sampling at every 0.5 sec after the timing of the above.

(16) C4 error (Heater high error)

1. When the thermistor temperature exceeds 240 degree C.

(17) C5 error (Heater low error)

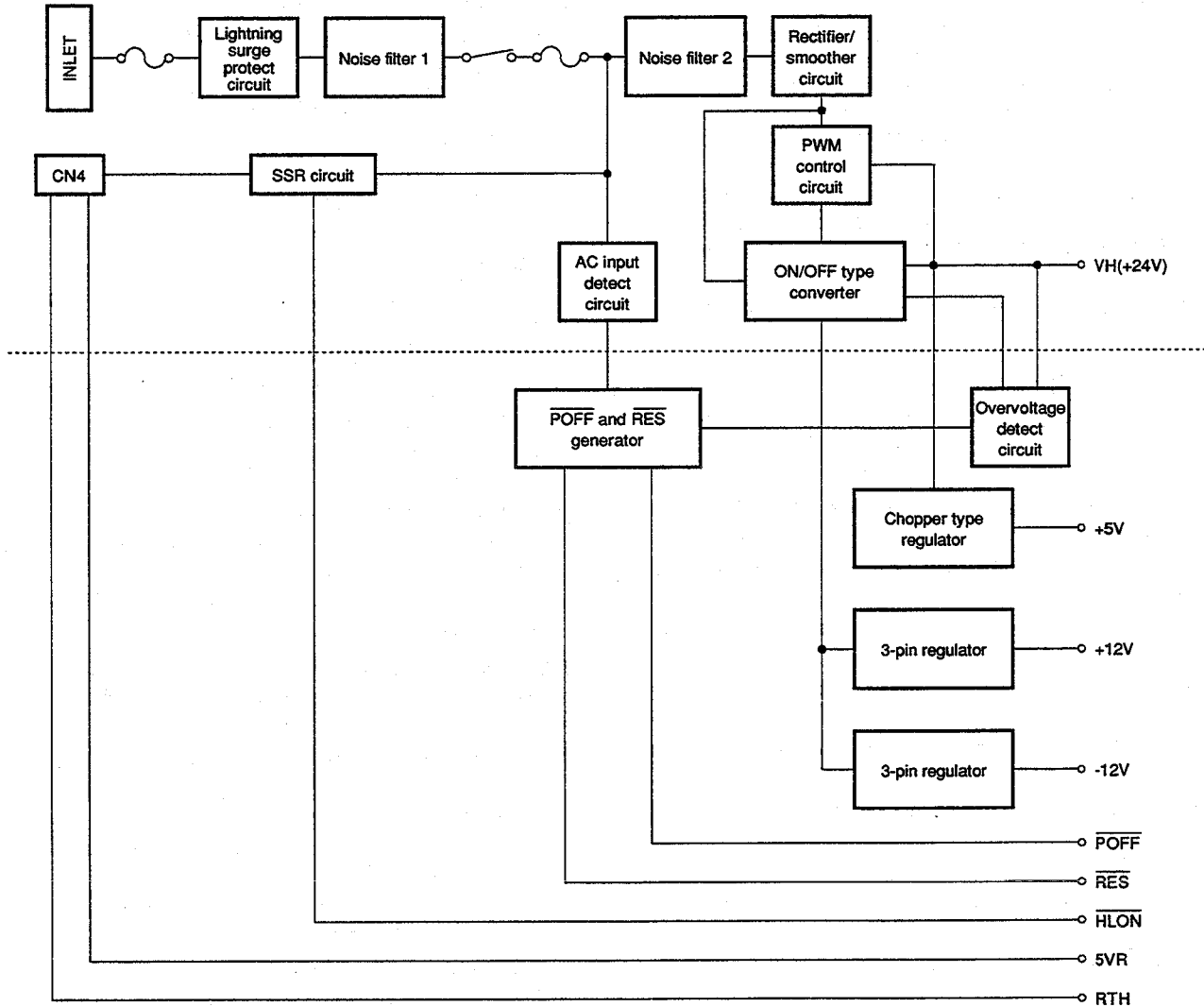
1. When the thermistor temperature falls under 100 degree C in the other modes than the warm up mode.

(18) C6 error (Thermistor open)

1. When RTH=0 is detected.

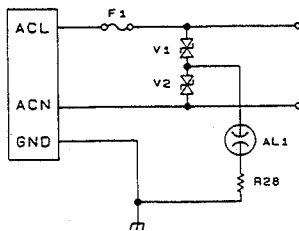
7. Power supply circuit

7-1. Circuit block diagram



7-2. Operational theory

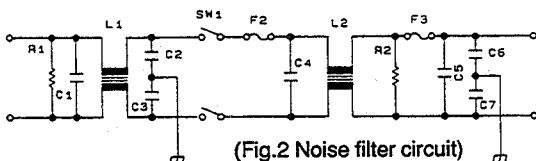
1. Lightning surge protect circuit



(Fig.1 Lightning surge protect circuit)

This circuit is provided to protect the power supply and the secondary circuit from damage by lightning surge that could be caused between the lines or line and ground.

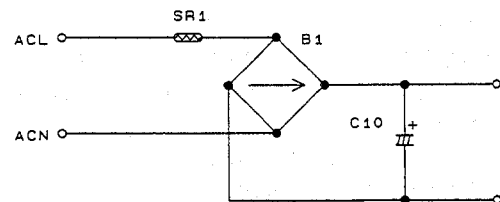
2. Noise filter circuit



(Fig.2 Noise filter circuit)

The noise filter is employed to prevent noise leakage from the power supply unit, as well as to prevent noise intrusion from external source.

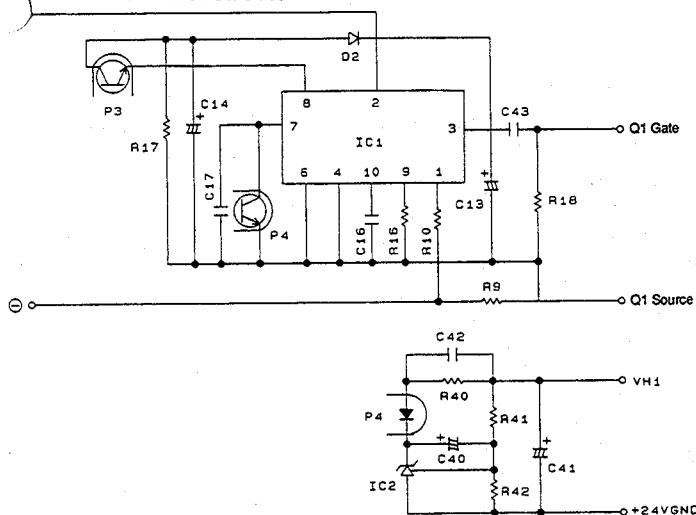
3. Rectifier/smoothing circuit



(Fig.3 Rectifier/smoothing circuit)

In this circuitry, AC input is rectified through the diode bridge and smoothed by the capacitor to provide 140VDC from 100VAC supply. Thyristor SR1 is employed to protect against surge current. It has a large resistance at power on. As its temperature rises, however, its resistance decreases, reducing energy loss.

4. PWM control circuit



(Fig.4 PWM control circuit)

The VH1 (+24V) output is provided by the PWM control circuit with IC1.

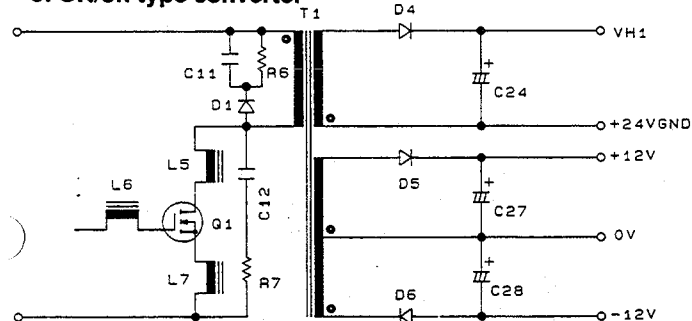
The VH1 output level is monitored by IC2 whose control output issued by P4 is transferred to IC1 to reduce the output signal width of the 3-pin output by IC1 when the voltage rises and expands the width when the voltage drops.

The capacitor C16 is employed to determine the oscillation frequency which is set to 100KHz for this power supply unit.

The resistor R16 is used to control the maximum on time; the on time becomes shortened when the resistance is decreased. Resistors R9 and R10 are used to monitor the current flowing through the drain and the source which acts to reduce the on pulse width when an overload occurs.

P3 is employed to protect from overvoltage which is used to shut off the IC1 output when overvoltage occurred.

5. ON/off type converter

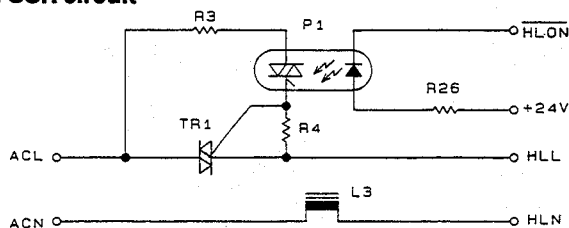


(Fig.5 On/off type converter circuit diagram)

For this power supply unit, an on-off type converter (ringing choke converter) is used for main AC/DC conversion circuit.

While Q1 is active, the energy is accumulated in T1 whose energy is released to the secondary side when Q1 is off. By controlling the T1 on time, the energy stored in T1 is adjusted to hold the secondary side output voltage to the given level.

6. SSR circuit

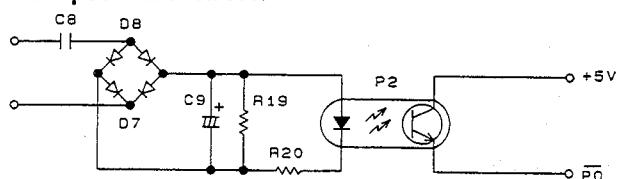


(Fig.6 SSR circuit)

This circuit is adopted for the halogen lamp control. With a low state of HLL signal, the HLL output is issued.

P1 is zero-cross type.

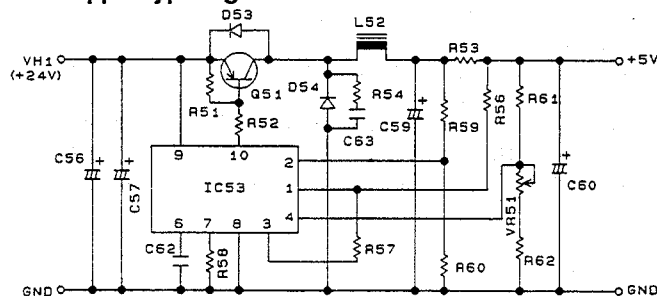
7. AC input detect circuit



(Fig.7 AC input detect circuit)

This circuit is used to inform presence of AC input to the secondary circuit using P2, which is used to generate POFF and RES signals.

8. Chopper type regulator



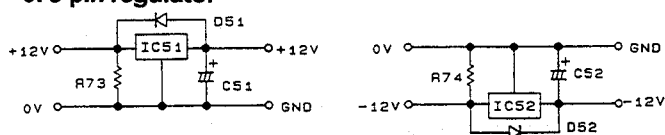
(Fig.8 Chopper type regulator circuit)

A PWM controlled chopper type regulator is employed to generate +5V from +24V.

The circuit is controlled by IC53. The on pulse width of Q51 is adjusted according to a +5V load so as to provide stable +5V output voltage.

C62 and R58 form the CR network used to determine the oscillation frequency. It is set to approximately 35KHz for this power supply unit.

9. 3-pin regulator

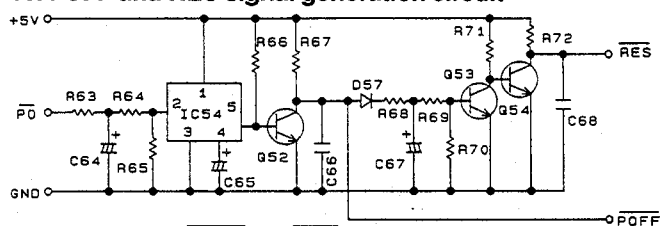


(Fig.9 3-pin regulator circuit diagram)

The $\pm 12V$ output from the AC/DC PWB is not stable, being affected by a load fluctuation of +24V output and $\pm 12V$ output. (+12V; +14V~20V, -12V; -14V~-20V)

The output is dropped by IC51 and IC52 to obtain the stable outputs. D51 and D52 are for protection of the 3-pin regulator.

10. POFF and RES signal generation circuit



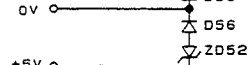
(Fig.10 POFF and RES signal generator circuit)

When the AC input is detected by the AC input detect circuit, P2 is turned on to charge C64. As this voltage is monitored by IC54, the POFF signal is set high. The time from AC input detection to POFF rising is determined by C65.

With a high state of POFF, C67 is charged via R68 and RES goes high after a delay of a time the capacitor is charged.

When AC supply is cut off, POFF goes low as the potential in C64 decreases and RES is set low after a delay of a time C67 is discharged.

11. Overvoltage detect circuit



(Fig.11 Overvoltage detect circuit)

If ZD52 and ZD51 zenor voltage exceeds the voltage limit of +5V and +54V output, P3 is activated to stop supplying to IC1.

[13] ICU section

1. About the ICU

1-1. To begin with

The laser printer is used in connection with the host as a personal computer from which the print data is supplied.

The laser printer consists of two major blocks of the controller and the print engine.

The controller consists of the ICU (Interface Control Unit) which is employed to interpret the source print data to create dot pattern information based on the font.

The print engine is the block employed to print the data of the dot pattern information. The print engine includes the laser print mechanism, drum mechanism, and paper feed mechanism which are controlled by PCU (Process Control Unit). Dot pattern information is sent to the laser print block that is controlled by the PCU where the data is converted into laser beams.

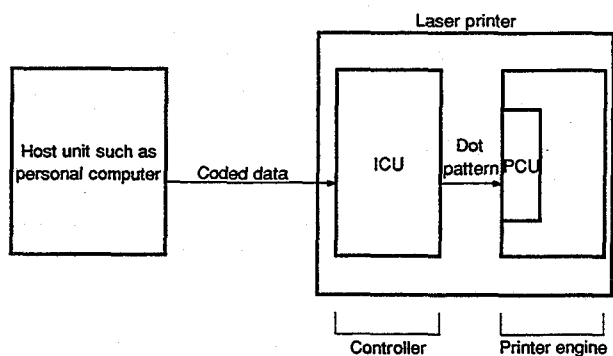
1-2. General

The JX-9500 print controller incorporates the RS232C and Centronics interface for connection with the host and the process controller (PCU) is connected as the video interface.

In this controller is contained the 68000 microprocessor for its CPU, high speed drawing chip for drawing control, and a 0.5MB CG memory which is expandable up to 4.0MB, enhancing fast processing of the data received from the host.

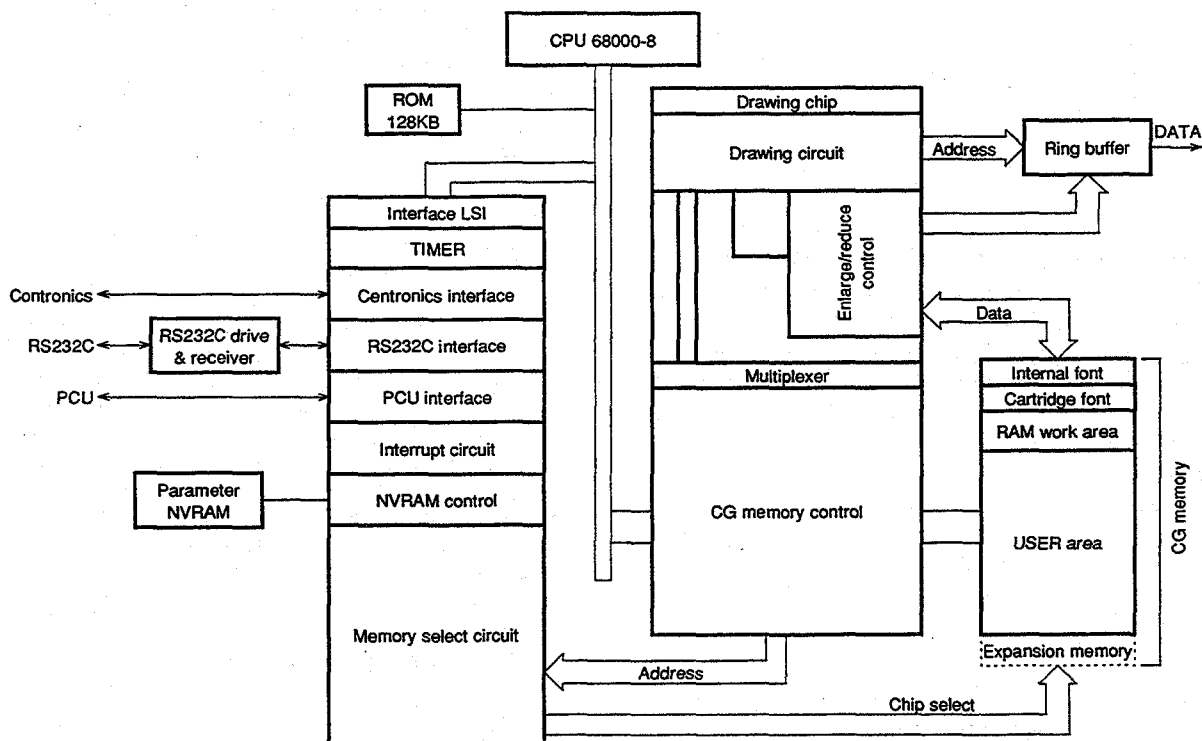
In the high speed drawing circuit, address lines are individually provided for the ring buffer and the CG memory, so that extremely high speed processing is enabled as the text data are directly written from the CG memory to the ring buffer.

Download font and image data may be written in the CG as the CPU is enabled to directly access the CG memory.



2. Basic hardware specifications

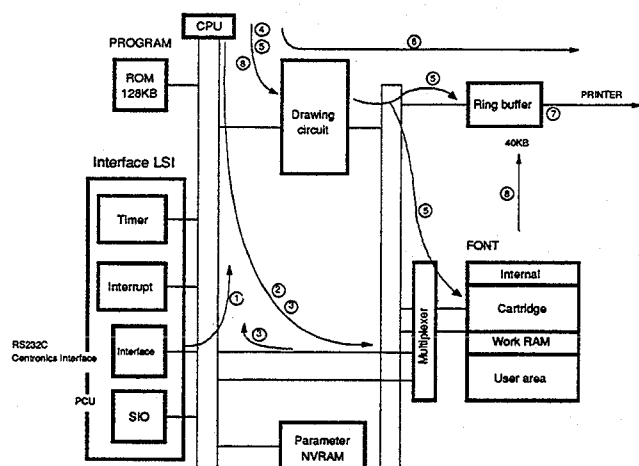
2-1. Block diagram



2-2. Data flow between blocks

- ① The print data is received from the host via the interface.
- ② The CPU stores the received data in the input buffer within the work area.
This action takes place each time data is received through the interface port using the interface interrupt routine.
- ③ The CPU reads the data from the input buffer and analyse it and stores it in the database buffer within the user area.
The soft font and bit image data received through the interface are also stored in the user area and both are handled the same as the CG data.
- ④ When the CPU finished creating the database for a page, the drawing start command is issued to the drawing circuit.
- ⑤ The CPU reads the database from the data bus buffer according to the request from the drawing circuit and sends them out to the drawing circuit.
- ⑥ When there is no more data to be written in the ring buffer (40KB, 128 lines), the CPU commands the print engine to start.
- ⑦ As the engine starts, the data within the ring buffer is read hardware-wise.
- ⑧ As the CPU monitors vacancy in the ring buffer, database is sent to the drawing circuit.

Above steps ⑤ to ⑧ are repeated until drawing operation is complete for one page.



2-3. Hardware configuration

- (1) CPU
68000-8
- (2) Drawing processor
16MHz LZ93J16, including the text drawing circuit and DRAM controller
- (3) Program ROM
512K EPROM x 2 (128KB)
- (4) RAM capacity
1M DRAM x 4 (512KB)
 - (1) User memory
 - (2) Work memory
 - (3) Database memory
- (5) CG ROM
Internal font ROM, 256KB

Courier	Elite
Courier Bold	Elite Script
Line Printer	Condence
Pica	Condence Script
Pica Script	

- (6) Interface LSI
CF78057, including the following blocks

- (1) Interface
Centronics interface (PIO)
RS232C interface (SIO)
PCU interface (SIO)
- (2) TIMER
 1. Baud rate generator for hardware
 2. Interval timer for software
 3. Scan width counter for hardware
- (3) Interrupt
Interrupt may be caused from one of the following blocks
Timer
Centronics interface
RS232C interface
PCU interface
Drawing circuit
- (4) Memory select
- (5) CPU connection
- (7) Ring buffer
256K DRAM X 2
Data are transferred from the user memory to the buffer one character at a time, and sent to the PCU in synchronization with the sync clock from the PCU.
- (8) Parameter NVRAM
Data related to paper size, country setting, interface condition, etc. are stored in the 16 x 16 NVRAM which can be revised from time to time.
- (9) Expansion memory
Expandable up to 4.5MB.
- (10) Cartridge font
Credit card type, optional
Two slot for the font cartridge
- (11) Power supply
5V, 2A, $\pm 12v$, 0.5A
- (12) PWB
185 x 240mm

3. Software interface

This section discusses about the hardware circuitry interfaced with the software.
Seven lines of interrupts are provided.

3-1. Interrupt

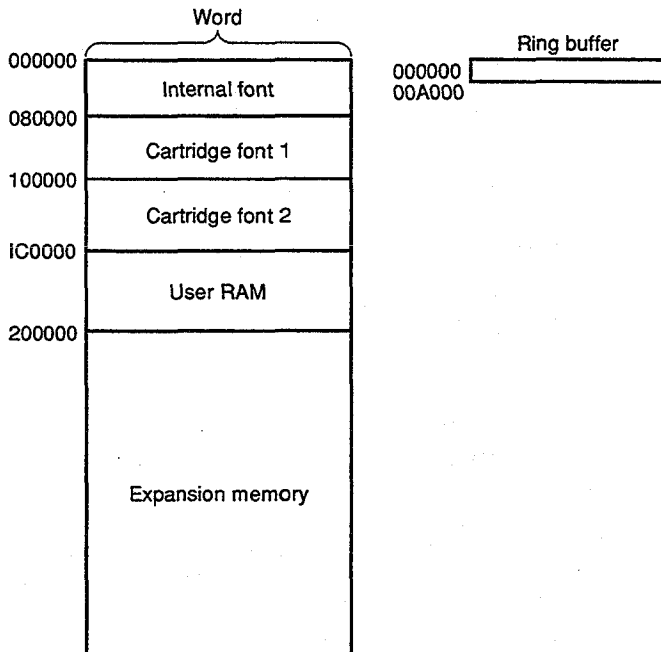
Interrupt levels

INT7	Power-OFF (NM1)
INT6	Not used
INT5	RS232C I/F interrupt
INT4	(Timer) interrupt
INT3	PCU interrupt
INT2	Drawing circuit (IRQ)
INT1	Centronics I/F interrupt

Interrupt is caused in the auto vector mode and exception process is required for the CPU.

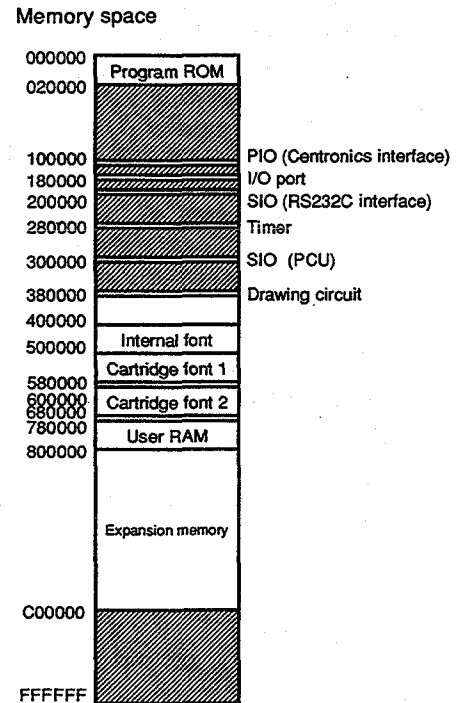
3-2. Drawing memory map

The memory address as seen from the graphic microchip is different from that of the 68000 microprocessor and the address is represented in terms of word address based on the internal font CG.



3-3. CPU memory map

(1) General mapping



(2) Detailed mapping

The following shows address space for the memory and I/O ports.

Item	Space (hexadecimal)	Description
Program ROM	000000(H) 020000(H)	ROM area where the control program is stored.
PIO (Centronics interface)	100000(H) 100006(H)	Used as an centronics interface.
I/O port	180020(H) 180080(H)	Used to status sens, Interrupt sens, Interrupt enable and NVRAM control.
SIO (RS232C interface)	200000(H) 200002(H)	Used as an RS232C interface.
Timer	280000(H) 280006(H)	Used as an timer, baud rate generator, and scan width counter.
SIO (PCU interface)	300000(H) 300002(H)	Used as an for communication with the PCU.
Drawing processor	380000(H)	Gate array implemented drawing control LSI
Internal font	400000(H) 4FFFFFF(H)	A 64KB ROM in which internal font is stored.
Cartridge font 1	500000(H) 57FFFF(H)	A 128KB, max. cartridge font (option)
Cartridge font 2	600000(H) 67FFFF(H)	A 128KB, max. cartridge font (option)
User RAM	780000(H) 800000(H)	A 512KB area provided for user memory, work area, and graphic work area
Expansion memory	800000(H) C00000(H)	Memory area can be expanded to 1.5MB, max. when an option is used.

3-4. I/O map

Port	Address	Bit position	Signal name	Description
Centronics interface control	IN 100000(H)	D15	DATA8	Centronics interface receive data
		D14	DATA7	
		D13	DATA6	
		D12	DATA5	
		D11	DATA4	
		D10	DATA3	
		D9	DATA2	
		D8	DATA1	
	OUT 100002(H)	D15	BUSY	Used to set/reset the BUSY signal.
		D14	PRIM CLR	Used to clear latch of INPUT PRIM.
		D13	ACK	ACK output port
		D12	PE	Paper empty signal output port
		D11	SLCT	Select signal output port
		D10	FAULT	Fault signal output port, active state of signal is represented by "0".
		D9		
		D8		
	IN 100004(H)	D15	Auto LF	Auto LF signal input
		D14	SLCT in	SCLT IN signal input
		D13	IBF	Input buffer full flip-flop output
		D12	STB	Strobe input
		D11	INTR	Interrupt output
		D10	PRIM	PRIM signal input
		D9		
		D8		
	OUT 100006(H)	D15	SET	1: mode set 0: bit set
		D14		
		D13		
		D12		
		D11		
		D10		
		D9		
		D8	INTE	Interrupt enable
Status sense	IN 180020(H)	D15	INPUT PRIM	Used to receive INPUT PRIM from the centronics interface
		D14	CRDY	Input of PCU interface CRDY signal
		D13	CG ON 1	Indicates installed CG cartridge 1
		D12	NVRAM DATA	NVRAM DATA serial input port
		D11	CGON 2	Indicates installed CG cartridge 2
Interrupt sense	IN 180060(H)	D15	IRQ INT	Receives scrail request interrupt from the drawing processor.
		D14	TIMER INT	Receives interrupt from the timer (interval time)
		D13	CE IN	Receives interrupt from the centronics interface
		D12	RS INT	Receives interrupt from the RS232C interface
		D11	HSYNC INT	Receives data transfer sync clock from the PCU
		D10	SP	Initial load of NVRAM

Port	Address	Bit position	Signal name	Description
Interrupt enable	OUT 180060(H)	D15	HSYNC INT EN	HSYNC interrupt enable output
		D14	TM INT EN	TIMER interrupt enable output
		D13	CE INT EN	Centronics interface interrupt enable output
		D12	PCU INT EN	PCU interface interrupt enable output
		D11	TO EN	Baud rate enable output
		D10	IRQ EN	Drawing processor interrupt enable output
		D9		
		D8	RS INT EN	RS232C interface interrupt enable output
NVRAM CONTROL	OUT 180080(H)	D15	NVRAM CS	NVRAM chip select output
		D14	DATA IN	NVRAM data output
		D13	CLOCK	NVRAM data sync output
		D12	RECALL	NVRAM data recall output
		D11	STORE	NVRAM data store output
		D10	RES	Drawing processor clear output
		D9	CG EN1	Cartridge font 1 enable output
		D8	CG EN 2	Cartridge font 2 enable output
TIMER	IN/OUT 280000(H) Baud rate divide parameter setting (mode 3)	D15		RS232C baud rate divide parameter setting 02(H) ... 19200BPS 20(H) ... 1200BPS 04(H) ... 9600BPS 40(H) ... 600BPS 08(H) ... 4800BPS 80(H) ... 300BPS 10(H) ... 2400BPS 100(H) ... 150BPS
		D14		
		D13		
		D12		
		D11		
		D10		
		D9		
		D8		
	IN/OUT 280002(H) Interval timer set- ting (mode 0)	D15		Basic clock input, 614.4KHz (cycle timer: 1.6276us) By counting the basic clock input, an interrupt is issued when the counter value reaches 0.
		D14		
		D13		
		D12		
		D11		
		D10		
		D9		
		D8		
	IN/OUT 280004(H) Scan width counter setting (mode 1)	D15		Sets up the data length of one raster in terms of bit
		D14		
		D13		
		D12		
		D11		
		D10		
		D9		
		D8		

Port	Address	Bit position	Signal name	Description																									
TIMER	OUT 280006(H) Control port	D15	SC1	Specify the counter to send the mode word.																									
		D14	SC0																										
				<table><tr><td colspan="2">Counter select</td><td>Function</td></tr><tr><td>0</td><td>0</td><td>Counter 0 Mode 3 RS232C baud generator</td></tr><tr><td>0</td><td>1</td><td>Counter 1 Mode 0 Timer 1 interrupt</td></tr><tr><td>1</td><td>0</td><td>Counter 2 Mode 1 Setting up the length for one raster, in terms of byte per page</td></tr></table>	Counter select		Function	0	0	Counter 0 Mode 3 RS232C baud generator	0	1	Counter 1 Mode 0 Timer 1 interrupt	1	0	Counter 2 Mode 1 Setting up the length for one raster, in terms of byte per page													
		Counter select		Function																									
		0	0	Counter 0 Mode 3 RS232C baud generator																									
		0	1	Counter 1 Mode 0 Timer 1 interrupt																									
		1	0	Counter 2 Mode 1 Setting up the length for one raster, in terms of byte per page																									
		D13	RL1	Select counter accessing mode.																									
		D12	RL0																										
				<table><tr><td colspan="2">Counter accessing mode</td></tr><tr><td>0</td><td>0</td><td>Count latch</td></tr><tr><td>0</td><td>1</td><td>LSB read/write</td></tr><tr><td>1</td><td>0</td><td>MSB read/write</td></tr><tr><td>1</td><td>0</td><td>Read/write in order of LSB and MSB</td></tr></table>	Counter accessing mode		0	0	Count latch	0	1	LSB read/write	1	0	MSB read/write	1	0	Read/write in order of LSB and MSB											
		Counter accessing mode																											
		0	0	Count latch																									
0	1	LSB read/write																											
1	0	MSB read/write																											
1	0	Read/write in order of LSB and MSB																											
D11	M2	Select counter operating mode.																											
D10	M1																												
D9	M0																												
		<table><tr><td colspan="3">Mode setting</td></tr><tr><td>0</td><td>0</td><td>0</td><td>Mode 0</td></tr><tr><td>0</td><td>0</td><td>1</td><td>Mode 1</td></tr><tr><td>x</td><td>1</td><td>0</td><td>Mode 2</td></tr><tr><td>X</td><td>1</td><td>1</td><td>Mode 3</td></tr><tr><td>1</td><td>0</td><td>0</td><td>Mode 4</td></tr><tr><td>1</td><td>0</td><td>1</td><td>Mode 5</td></tr></table>	Mode setting			0	0	0	Mode 0	0	0	1	Mode 1	x	1	0	Mode 2	X	1	1	Mode 3	1	0	0	Mode 4	1	0	1	Mode 5
Mode setting																													
0	0	0	Mode 0																										
0	0	1	Mode 1																										
x	1	0	Mode 2																										
X	1	1	Mode 3																										
1	0	0	Mode 4																										
1	0	1	Mode 5																										
D8	Count mode: 0; binary, 1; BCD	Specifying count data to be binary or BCD.																											
RS232C	OUT 200002(H)	D15	S2	Setting stop bit length																									
		D14	S1																										
				<table><tr><td>0</td><td>0</td><td>Not used.</td></tr><tr><td>0</td><td>1</td><td>1 bit</td></tr><tr><td>1</td><td>0</td><td>(Not used)</td></tr><tr><td>1</td><td>1</td><td>2 bits</td></tr></table>	0	0	Not used.	0	1	1 bit	1	0	(Not used)	1	1	2 bits													
		0	0	Not used.																									
		0	1	1 bit																									
		1	0	(Not used)																									
		1	1	2 bits																									
		D13	EP	Even Parity (1: even, 0: odd)																									
		D12		PARITY-EN Parity enable																									
		D11	L2	Setting character bit size																									
		D10	L1																										
				<table><tr><td>0</td><td>0</td><td>(Not used)</td></tr><tr><td>0</td><td>1</td><td>(Not used)</td></tr><tr><td>1</td><td>0</td><td>7 bits</td></tr><tr><td>1</td><td>1</td><td>8 bits</td></tr></table>	0	0	(Not used)	0	1	(Not used)	1	0	7 bits	1	1	8 bits													
0	0	(Not used)																											
0	1	(Not used)																											
1	0	7 bits																											
1	1	8 bits																											

Port	Address	Bit position	Signal name	Description	
RS232C		D9	B2	1	
		D8	B1	0	Baud Rate Factor setting baud rate dividing ratio (Fixed to 1/16)
	OUT 200002(H)	D15	EH	Not used	
		D14	IR	Internal reset (must be executed before turning on PS.)	
		D13	RTS	RTS signal	
		D12	ER	Status word error reset	
		D11	SBRK	Send brake TxD fixed to 0	
		D10	RxE	Receive enable	
		D9	BTR	BTR signal output, causes DTR low.	
		D8	TxEN	Send enable	
	IN 200002(H)	D15	DSR	DSR (Data Set Ready) signal input	
		D14	SYNDET/3D	Not used	
		D13	FE	Framing error (stop bit detect not enabled)	
		D12	OE	Overrun error	
		D11	PE	Parity error	
		D10	TxE	Transmit buffer empty	
		D9	RxRDY	Data receive enabled (receive interrupt)	
		D8	TxRDY	Send enabled used for transmit end interrupt signal	
	OUT 200000(H)	D15	SD8	RS232C interface transmit data	
		D14	SD7		
		D13	SD6		
		D12	SD7		
		D11	SD4		
		D10	SD3		
		D9	SD2		
		D8	SD1		
	IN 200000(H)	D15	RD8	RS232C interface data	
		D14	RD7		
		D13	RD6		
		D12	RD5		
		D11	RD4		
		D10	RD3		
		D9	RD2		
		D8	RD1		

Port	Address	Bit position	Signal name	Description	
SIO (PCU)	OUT 300002(H)	D15	S2	"0"	Sets to the stop bit size 1.
		D14	S1	"1"	
		D13	EP	x	
		D12	PARITY-EN	"0"	No parity
		D11	L2	"1"	
		D10	L1	"1"	
		D9	B2	"1"	Data size sets to 8 bits. Baud rate sets to 1/64 (9600bps) Basic clock 614.4KHz divided into 1/64.
		D8	B1	"1"	
	IN3000002(H)	D15	DSR	READY	PCU READY input
		D14			Not used.
		D13	FE		Framing error
		D12	OE		Overrun error
		D11	PE		Parity error
		D10	TXE		Transmit buffer empty
		D9	RXRDY		Data receive, cause for PCU interrupt.
		D8	TXRDY		Receive enable
	OUT 300002(H) Command	D15	EH		Not used
		D14	IR		Internal reset executed at power on.
		D13	RTS	PRIM	PRIM signal to the CPU
		D12	ER		Error reset
		D11	SBRK		Send break character fixed to 0.
		D10	RXE		Receive enable
		D9	DTR	PAGE	PAGE signal to the CPU.
		D8	TXEN		Send enable
	OUT 300000(H)	D15	SD8		Transmit data (CMD) to the PCU.
		D14	SD7		
		D13	SD6		
		D12	SD5		
		D11	SD4		
		D10	SD3		
		D9	SD2		
		D8	SD1		
	IN 300000(H)	D15	RD8		Receive data from the PCU (STS)
		D14	RD7		
		D13	RD6		
		D12	RD5		
		D11	RD4		
		D10	RD3		
		D9	RD2		
		D8	RD1		

READY: Indicates that the PCU is in the ready to print condition.

PRIM: Initialize request signal to the PCU.

PAGE: Print start request signal to the PCU.

Framing error: Caused if the stop bit was not correctly recognized.

Overrun error: Caused if the CPU speed is slower than the baud rate received, and the received data are lost in this case.

Port	Address	Bit position	Signal name	Function									
Drawing processor	OUT 380000(H) Control register address	D15		Font address	Font address	Font address	Character height	0	0	0	Start drawing	End drawing	
		D14											
		D13											
		D12											
		D11		HPOS	VPOS		Character width	Horizontal magnification ratio	Vertical magnification ratio	Bold			
		D10											
		D9											
		D8											
		D7											
		D6											
		D5											
		D4											
		D3											
		D2											
		D1											
		D0											

Data send to the same address at a time.

Port	Address	Bit position	Signal name	Function
Drawing processor	IN 380000(H) Status register address	D15	BUSY	In drawing processing, data transfer not enabled.
		D14	Buffer Full	Ring buffer full, drawing processing not enabled.
		D13	ERROR	DATA LOSS ERROR (OVERRUN)
		D12		Not used.
		D11		
		D10		
		D9		
		D8		
		D7		
		D6		
		D5		
		D4		
		D3		
		D2		
		D1		

4. Drawing processor

The drawing processor is a gate array composed of 5000 gates. Its internal consists of the text drawing circuit, memory address bus, and the memory control generating DRAM controller.

It has four external interface buses which are shown in Fig.4-1.

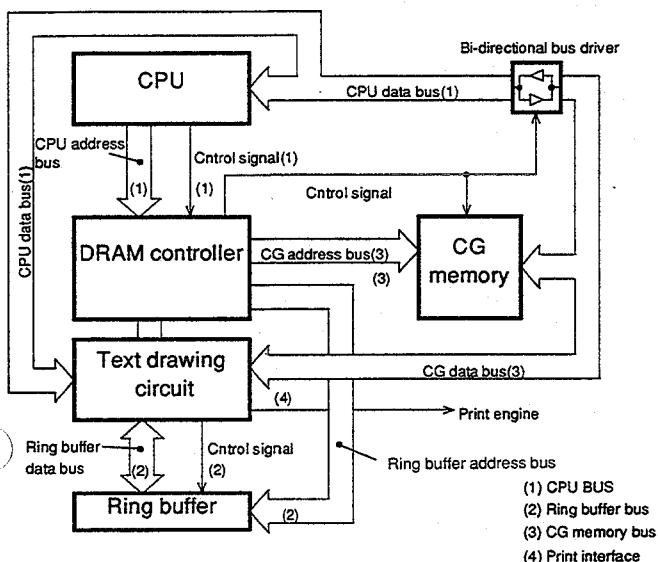


Fig. 4-1. Drawing processor external bus

The CG memory is accessed by the CPU and the drawing circuit, the DRAM controller selects accessing from the CPU and the drawing circuit.

Address bus is selected within the DRAM controller and data bus within the bidirectional bus driver.

The drawing circuit has the first access privilege.

When the drawing circuit accesses the ring buffer, the ring buffer data bus of (2) and the ring buffer address bus are used.

Video signal to the print engine is transferred from the drawing circuit via the printer interface of (4).

• Drawing processor block diagram

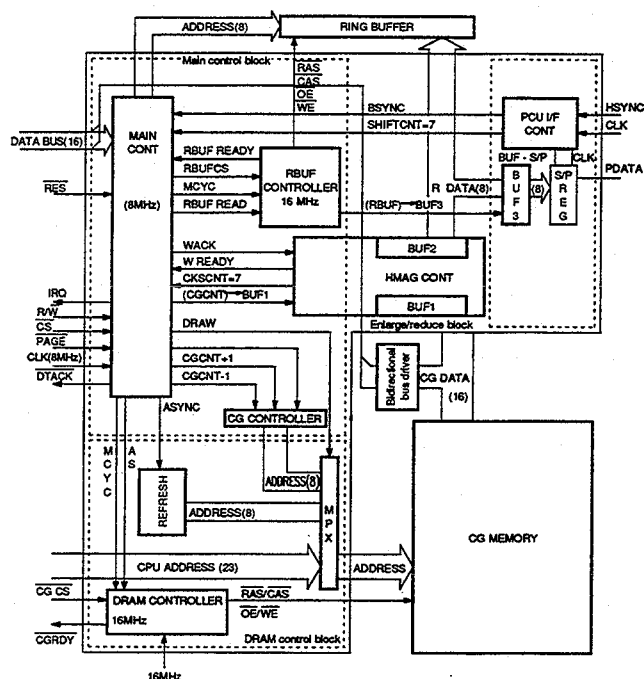
■ The drawing processor is implemented in the gate array and it can be divided into four blocks of ① main control block, ② DRAM control block, ③ enlarge/reduce block, and ④ PCU interface block.

The main control block is used to interpret the CPU command, interrogates buffer full and overrun error, and is used to form drawings.

The DRAM control block is employed to control the drawing processor connected CG memory and the ring buffer DRAM which can be accessed by both drawing circuit and CPU.

The enlarge/reduce block is employed to write the contents of the CG memory into the ring buffer according to the direction from the main control block.

The PCU interface block has the function to convert the given data into a serial equivalent according to the PCU clock and sync signal (HSYNC) to send it to the PCU.



Drawing processor block diagram

4-1. About the text drawing circuit

The drawing circuit receives through the CPU bus ① the font stored CG memory address (which will be simply referred to as source address, hereinafter), ② address of the ring buffer to make a drawing (which will be simply referred to as a destination address, hereinafter), ③ size of font, and ④ enlarge/reduce data. Data transferred from the source memory are processed according to the above and written in the ring buffer via the ring buffer bus.

Since only a part (128 dot line) is provided in the ring buffer, different from a full page memory, it will repeat writing new data after accessing the ring buffer.

Read is achieved in synchronization with the external sync signal (HSYNC) and transferred to the external print engine at every video clock.

4-2. DRAM controller

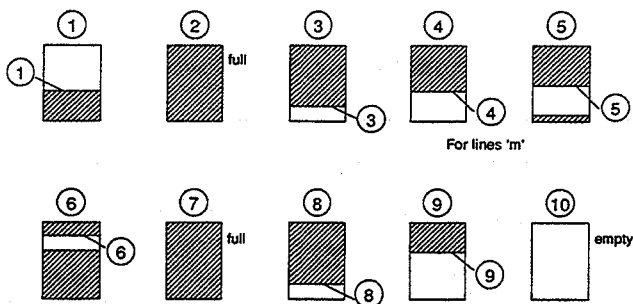
The DRAM controller of the drawing processor controls and refreshes the DRAM of the CG memory and ring buffer.

The control will access ① the CG memory DRAM by the CPU and ② access the CG memory and ring buffer DRAM by the drawing circuit, changing the bus.

Signals are generated to control the CG memory and drawing circuit.

4-3. Ring buffer operational theory

- ① When the CPU directs the drawing circuit to start, the bit image data is written in the ring buffer one character at a time.
- ② Bit image data is repeated to write. This figure shows when the ring buffer (40KB, 128 lines) is fully occupied.
- ③ Bit image data within the ring buffer are read to the drawing circuit. (The drawing circuit transfers the data to the print engine in synchronization with the external sync signal HSYNC.)
- ④ The figure shows when lines "m" are open (available) after the bit image data are read and that it is ready to accept a new bit image data of "m" lines.
- ⑤ The figure shows when the first few lines of the new bit image data are written, while the data is read at the same time.
- ⑥ This figure shows that a bit image data is written after bit image data of "m" lines have been written.
- ⑦ The figure shows that the ring buffer has been fully occupied after the new bit image data were written after the previous bit image data have been read.
- Steps ③ thru ⑥ are repeated hereafter.
- ⑧ & ⑨ As no more bit image data is written, the area begins to open.
- ⑩ The ring buffer became empty after all the bit image data is read by the drawing circuit.



4-4. Print data transmission method

- ① When the CPU finishes creating the database for a page, the drawing circuit is commanded to send PAGE to the print engine with a low state of PAGE.
- ② When the PCU within the print engine received PAGE, the engine is started and the HSYNC signal is issued to the drawing circuit.
- ③ As the drawing circuit receives the command to start the drawing circuit, the database within the ring buffer is read and the data is sent to the print engine in synchronization with the input clock, each line synchronizing with HSYNC.
- ④ Data continues to be transferred to the print engine.
- ⑤ When all data have been transferred, the CPU sets PAGE high for the print engine. With this appearance of PAGE, the PCU disables HSYNC output so that the drawing circuit stops transferring data to the PCU.

5. NVRAM

The S2444R is a non-volatile CMOSRAM. Data consists of 16 words x 16 bits and can be transferred serial on a single data bus. Each bit of the RAM is in pair with a non-volatile EEPROM. Data transfer between the RAM and the EEPROM takes place in response to a command from the processor, STORE, and RECALL. While the non-volatile data are stored in the EEPROM, the RAM data are read independently. The NVRAM is used to store the parameter for paper size, emulation. (For details, refer to PCU circuit NVRAM.)

6. Expansion memory

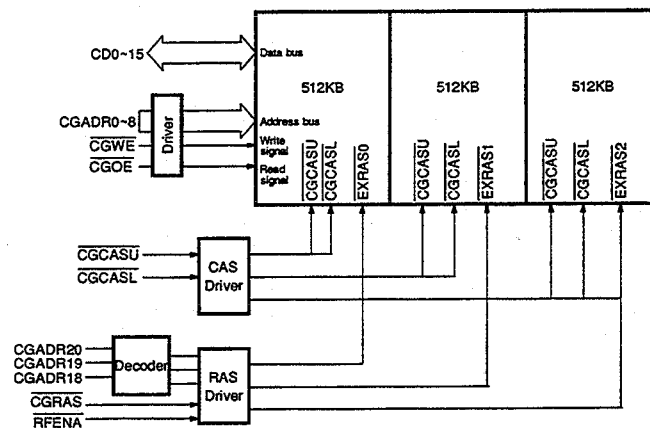
6-1. General

The expansion memory is connected to the ICU and used as expansion memory for the user RAM area.

Using the chips of 256K x 4-bit memory, it totals up to 4.0MB.

6-2. Block diagram

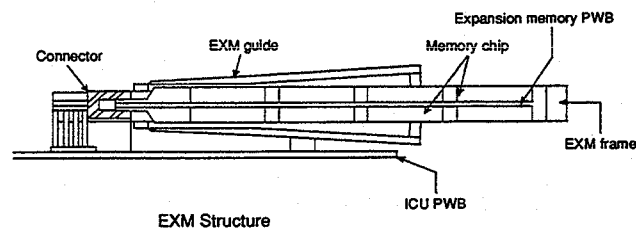
See Fig.6-1.



6-3. Configuration

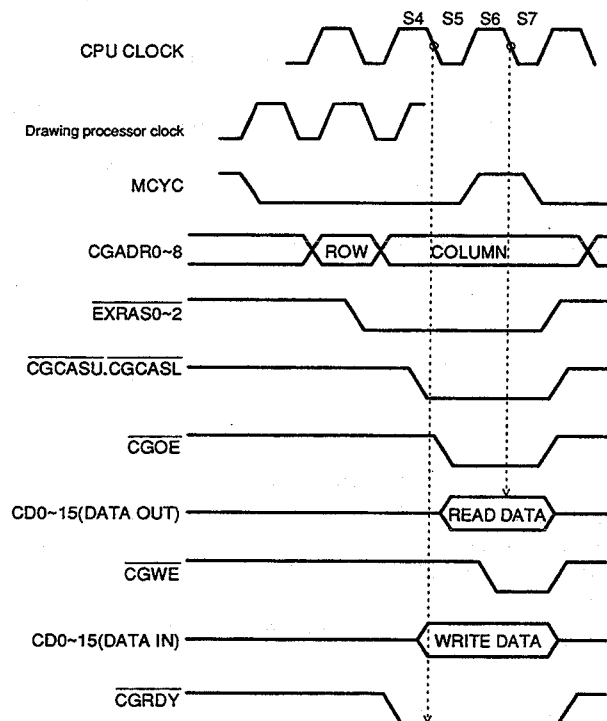
The memory card is directly installed above the ICU PWB via the connector.

SOJ type memory chips are mounted on the board to constitute the total memory capacity up to 4.0MB.



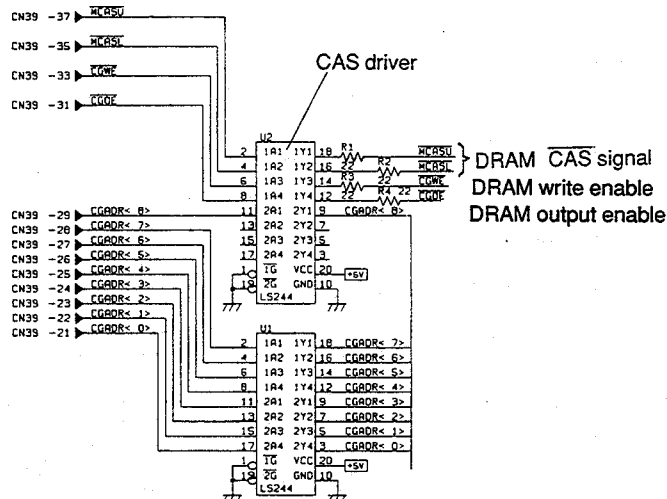
6-4. Operational theory

6-4-1. Access timings



6-4-2. CAS driver

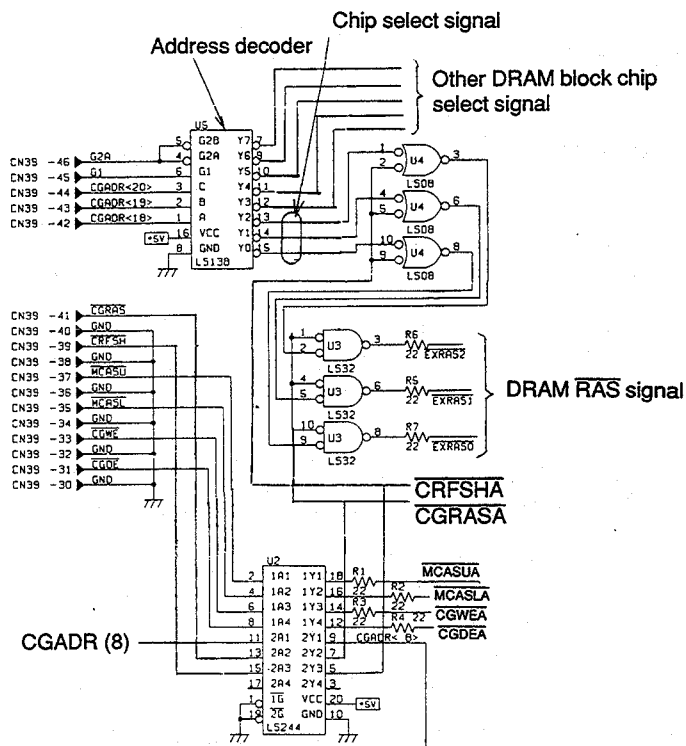
CGCASU and CGCASL are given to the DRAM.



6-4-3. RAS driver

CGADR18 to CGADR20 are decoded to create EXTRAS0 to EXTRAS6.

As all chips are refreshed at the same time, EXTRAS0 to EXTRAS6 are issued at the same moment.



6-5. Interfacing signals

CGADR8 to CGADR0 are address signals multiplexed by the ICU.

CGWE: Memory write signal

CD15 to CD0: 16 data signals

CGCASU: CAS signal given to the memory which indicates that high order data CD15 to 8 are being accessed.

CGCASL: CAS signal given to the memory which indicates that low order data CD7 to 0 are being accessed.

EXTRAS: RAS signal given to the memory.

RFENA: Refresh signal.

CGOE: Memory read signal.

7. Connector signals

See ICU circuit-4 (Connector section)

8. Circuit description

Circuit operation can be explained in three divisions, CPU related, user memory related, and drawing circuit related.

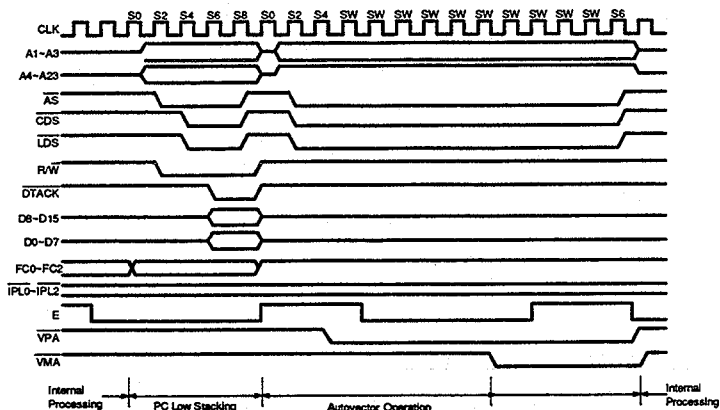
8-1. CPU peripherals

The 68000-08 is used for the CPU and operated under 8MHz.

All interrupts are caused in the auto vector mode, interrupt address is assigned automatically in connection with interrupt level. The interrupt acknowledge signal ACK is supplied to the -VPA line of the CPU. This line indicates to handle it in the auto vector mode when an interrupt is requested.

The watchdog timer counts the clock E (0.8MHz) issued by the CPU to cause a bus error. Bus cycle is divided into the read bus cycle, write bus cycle, and interrupt acknowledge bus cycle.

(1) Interrupt bus cycle

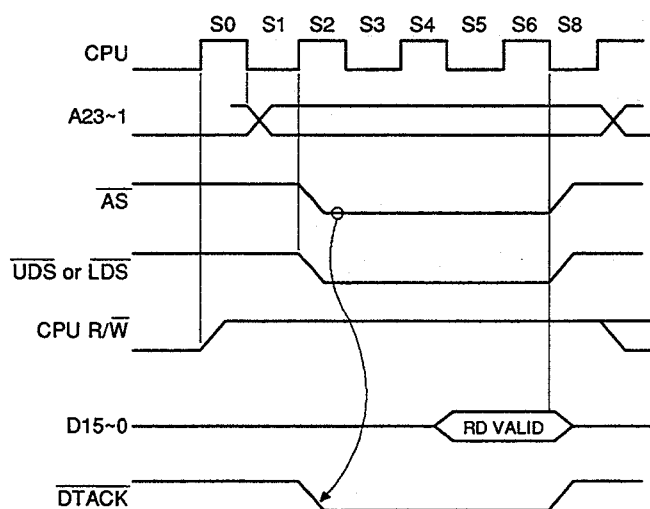


Interrupt acknowledge bus cycle

(2) Read bus cycle-1

Related resource

EPROM (128KB), Interface LSI, General I/O

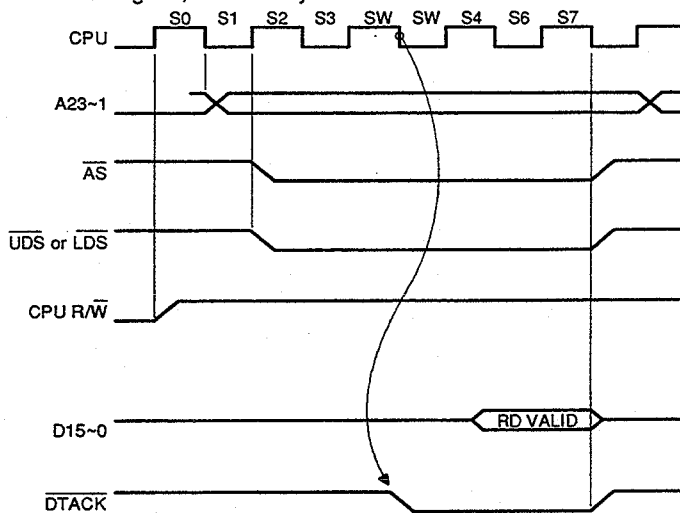


CPU read bus cycle-1

(3) Read bus cycle-2

Related resource

Drawing LSI, CG memory

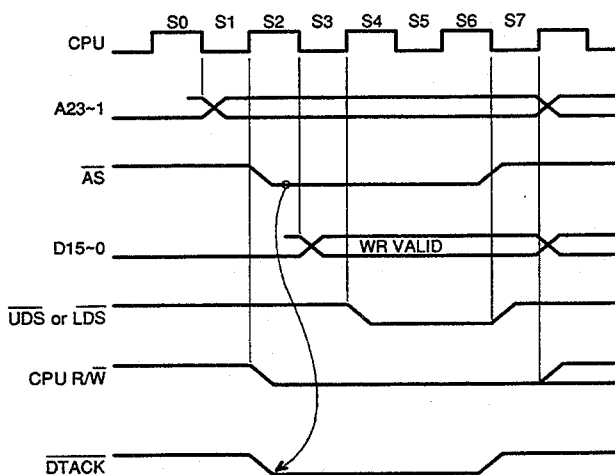


CPU read bus cycle-2 (1 wait)

(4) Write bus cycle-1

Related resource

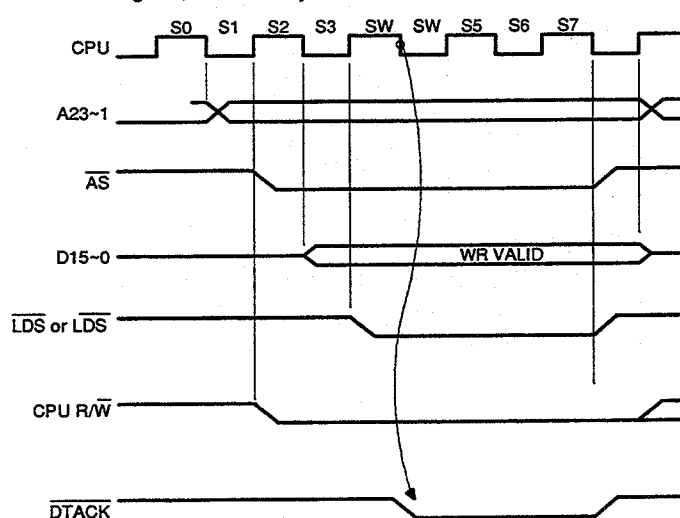
EPROM, Interface LSI, General I/O



(5) Write bus cycle-2

Related resource

Drawing LSI, CG memory



CPU write bus cycle-2 (1 wait)

Address strobe ($\overline{AS}$): This signal indicates that there is a valid address on the address bus.

Read/write ($R/\overline{W}$): This signal defines the data bus transfer as a read or write cycle.

Upper and lower data strobe ($\overline{UDS}$, $\overline{LDS}$):

These signals control the flow of data on the data bus, as shown in Table 8-4-1. When the $R/\overline{W}$ line is at a high, the processor will read from the data bus as indicated. When the $R/\overline{W}$ line is at a low, the processor will write to the data bus as shown.

$\overline{UDS}$	$\overline{LDS}$	$R/\overline{W}$	D8-D15	D0-D7
High	High	—	No Valid Data	No Valid Data
Low	Low	High	Valid Data Bits 8-15	Valid Data Bits 0-7
High	Low	High	Non-valid Data	Valid Data Bits 0-7
Low	High	High	Valid Data Bits 8-15	No Valid Data
Low	Low	Low	Valid Data Bits 8-15	Valid Data Bits 0-7
High	Low	Low	Valid Data Bits 0-7*	Valid Data Bits 0-7
Low	High	Low	Valid Data Bits 8-15	Valid Data Bits 8-15*

Table 8-4-1

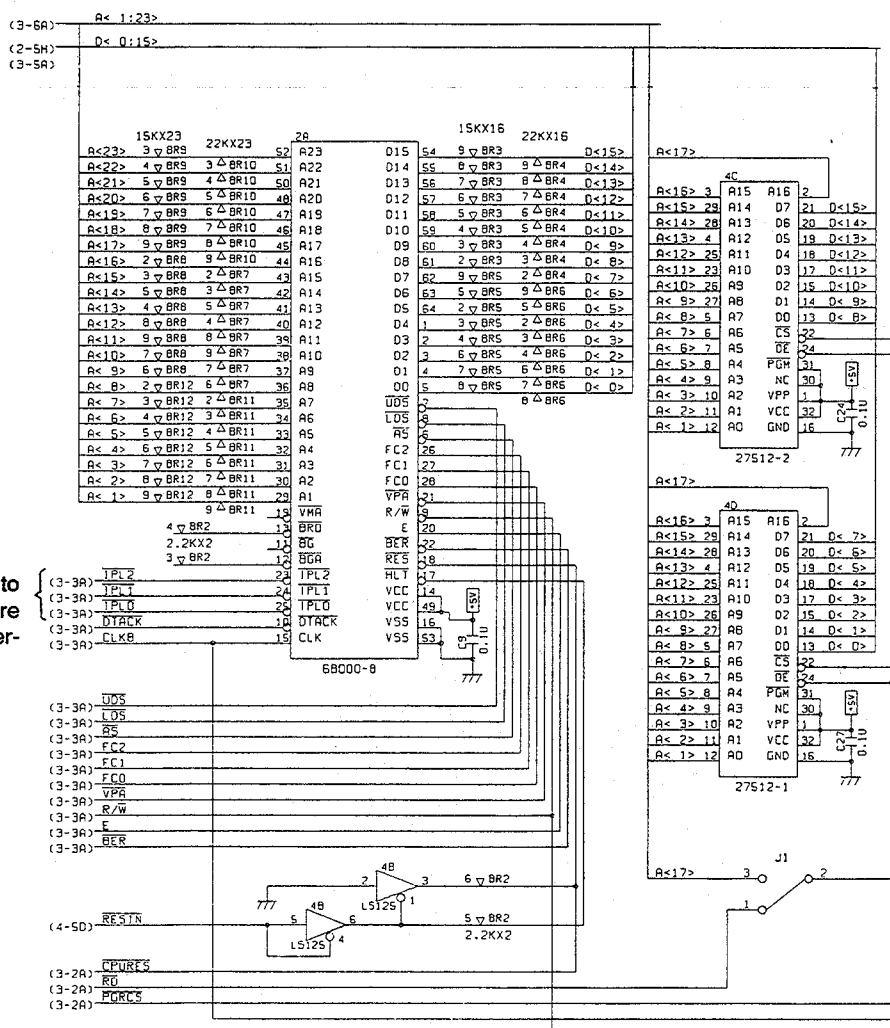
These conditions are results of current implementation, and may not appear on future devices.

* These conditions are result of current implementation, and may not appear on future devices.

Data transfer acknowledge ($\overline{DTACK}$):

This input indicates that the data transfer is completed. When the processor recognizes $\overline{DTACK}$ during a period of a read cycle, data is latched and the bus cycle terminated. When $\overline{DTACK}$ is recognized during a write cycle, the bus cycle is terminated.

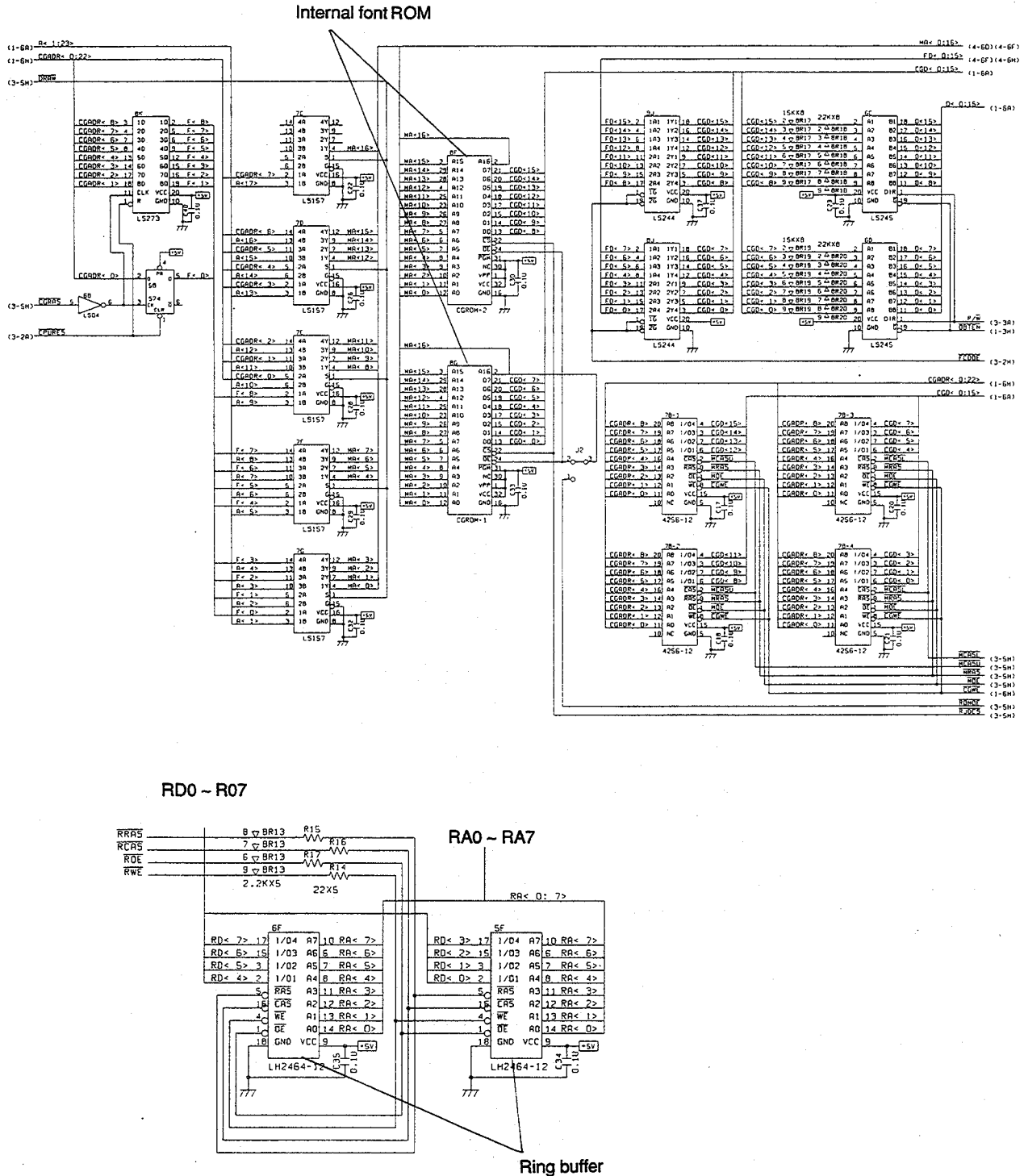
Interrupt is encoded to these three lines before sent to CPU from Interface LSI.



8-2. Memory circuit

The memory circuit consists of the internal font ROM, interface with the cartridge font, read/write enabled RAM, and the ring buffer. The user RAM is used by the CPU for the work RAM, CG RAM, and down load font RAM area.

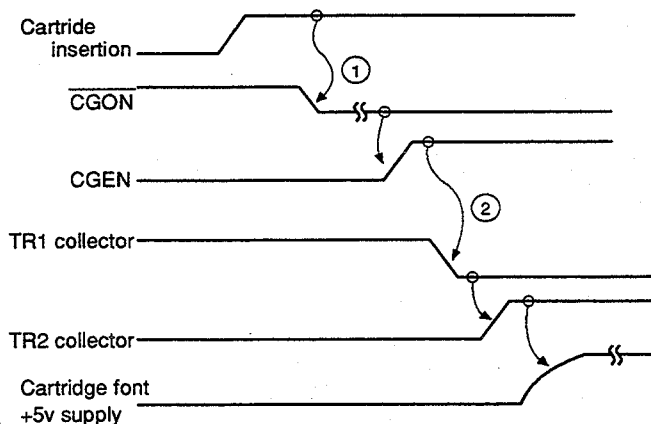
The ring buffer has another address and data bus as a drawing area, apart from the above memory.



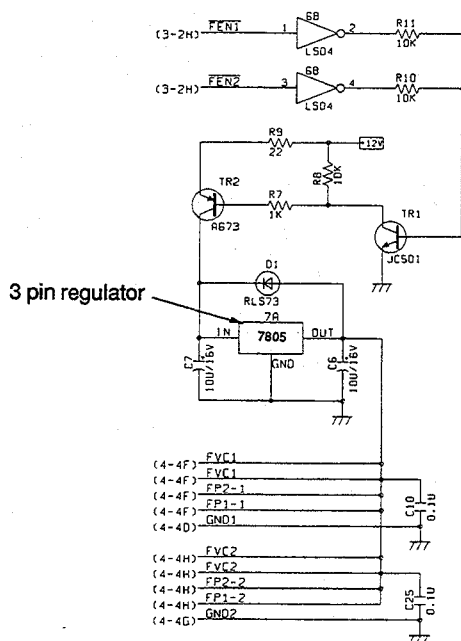
Cartridge font interface

By accessing the character font cartridge in the following sequence, the circuit prevents the cartridge font from being damaged when removing and installing the cartridge font, as well as preventing a CPU malfunction.

Cartridge font power supply sequence



- ① When the cartridge font is inserted in the machine, pin 6 of CN52, CN53 shorts with pin 58. This causes pin 6 to go low level so that CGON is forced high. As this causes CGON1, CGCN2 to go low, the CPU becomes enabled to access the cartridge font.
- ② With a low state of FEN1, FEN2 the CPU bus becomes enabled and both TR2 and TR1 turns on, so that the +5V is supplied to the cartridge font.

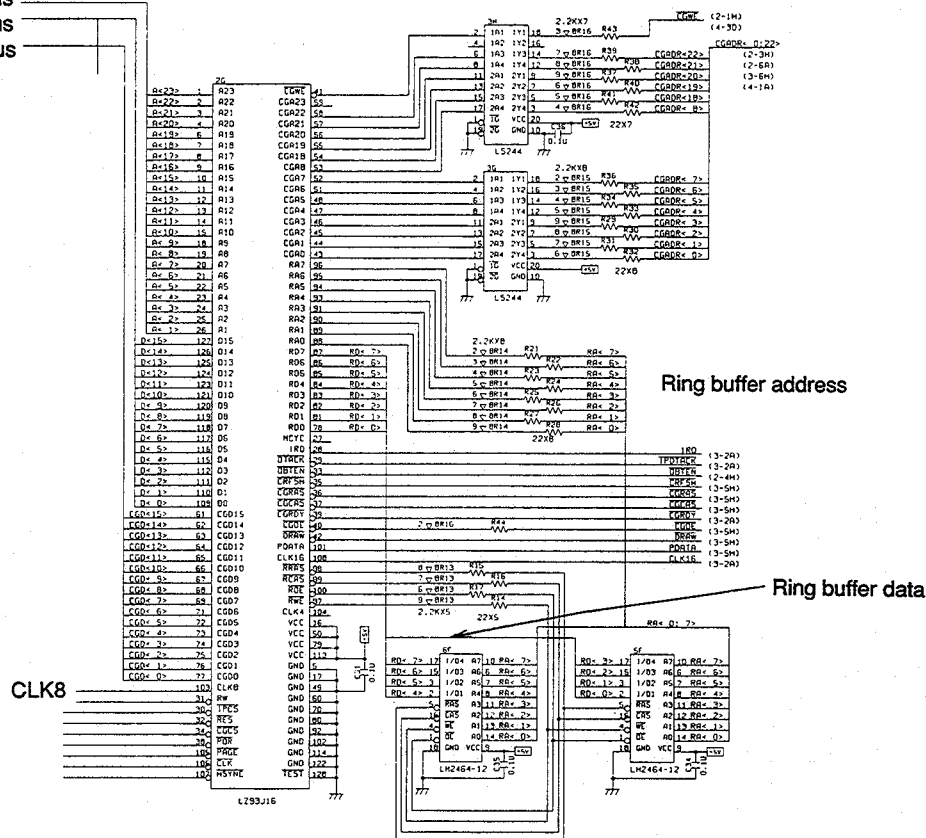


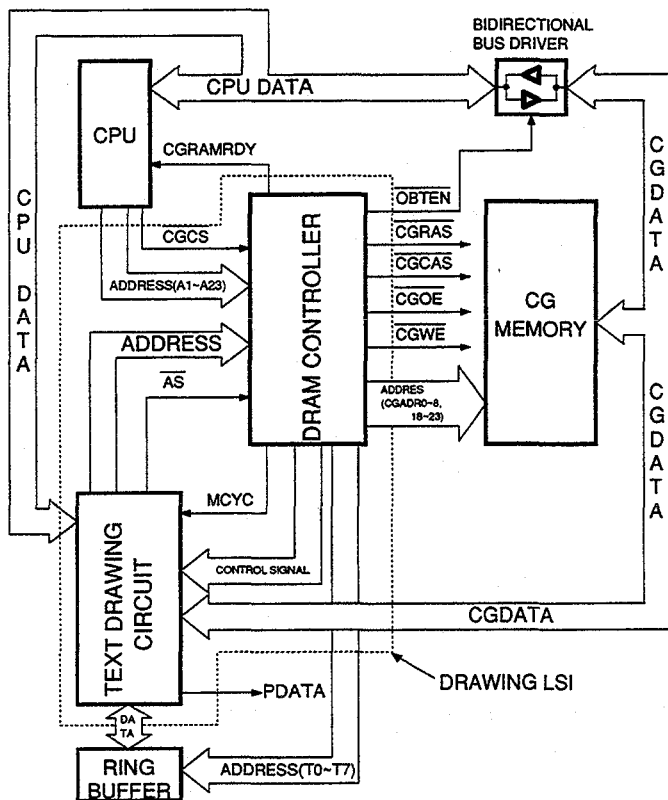
8-3. Drawing processor peripherals

The drawing circuit writes a bit image (drawing data) in the ring buffer and sends the bit image within the ring buffer to the PCU.

The drawing circuit interprets a 5-word data from the CPU (68000) and returns the CG data to the ring buffer one character at a time. The text drawing processor peripheral circuits are connected with the address data bus from the CPU, CG memory and ring buffer. The RAM area is automatically refreshed, and the CG memory can be read and written from the CPU and via the drawing processor.

A1 ~ A23 CPU address bus
D0 ~ D15 CPU data bus
CGD0 ~ CG15 CG memory data bus





Drawing LSI peripheral block diagram

Pin assignment and layout

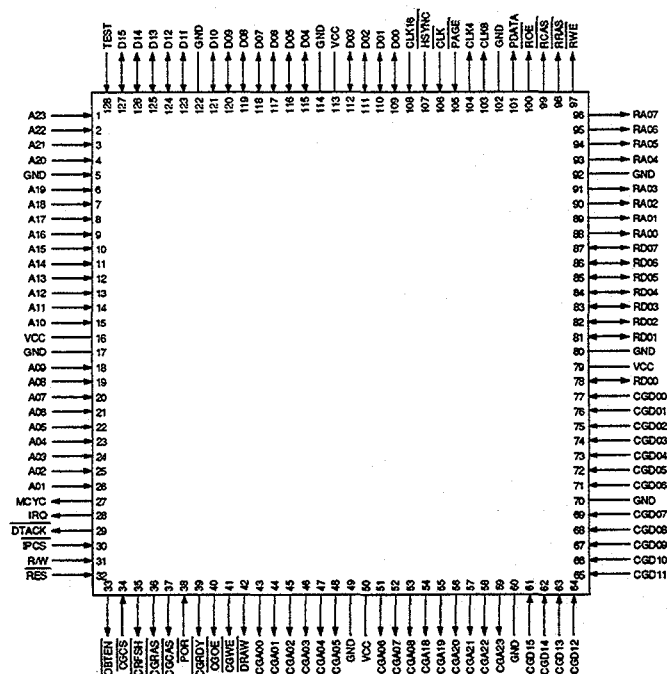


Fig. 8-4-2. Drawing LSI pin layout

Pin functional description

Pins are divided into groups of power supply lines, MPU interface signal lines, DRAM interfacing signal lines, ring buffer interfacing signals, and attribute control signal lines, of which functions are described next.

1. Power supply

Vcc: Pin numbers, 16, 50, 79, 113

V_{SS}: Pin numbers, 5, 17, 49, 60, 70, 80, 92, 102, 114, 122

These lines are used to supply power to the drawing processor.

 $V_{CC} = 5V \pm 5\%$

$V_{SS} := \text{Ground}$

8-3-1. CPU interface

The CPU data bus is directly connected to the text drawing circuit, as well as the CPU address bus. This permits the CPU to make direct accessing to the drawing circuit within text drawing processor.

The CPU interface consists of the following buses.

Address bus (A01 to A23)

Data bus (D00 to D15)

Control signal ($\overline{\text{RES}}$, IRQ , $\text{R}\overline{\text{W}}$, $\overline{\text{IPCS}}$, $\overline{\text{PAGE}}$, $\overline{\text{DTACK}}$, $\overline{\text{CGCS}}$, $\overline{\text{CGRDY}}$)

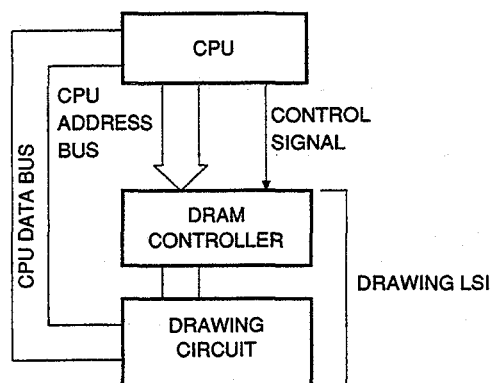
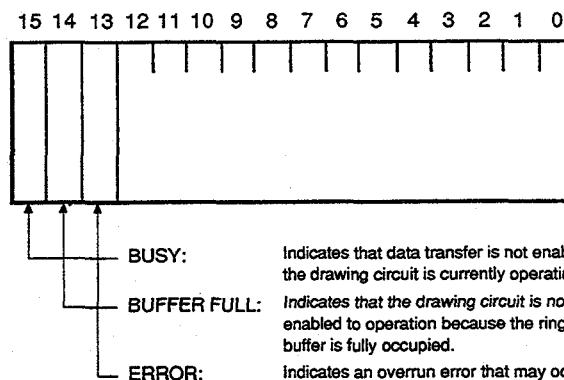


Fig.8-4-3. Interface with the CPU

The drawing circuit receives a 5-word control code from the CPU and sends a 1-word status code to the CPU.

The CPU will know how the previous issued control code was processed by the drawing circuit, by reading the status code that returned against an interrupt request (IRQ) from the drawing circuit. If the drawing circuit was found to be ready for a drawing operation after interrogating the status code, the CPU will let it start by sending the following control code to the drawing circuit.

■ Status code description



BUSY:

Indicates that data transfer is not enabled as the drawing circuit is currently operating.

BUFFER FULL:

Indicates that the drawing circuit is not enabled to operation because the ring buffer is fully occupied.

ERROR:

Indicates an overrun error that may occur when the data transferred to the print engine exceeded writing the drawing data in the ring buffer within the drawing circuit.

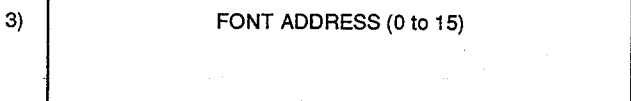
■ Control code description



HPOS: Horizontal position on paper (by dots)



VPOS: Vertical position on paper (by dots)

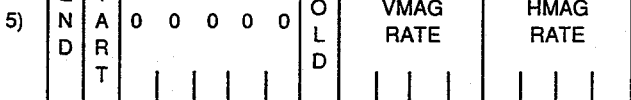


Font address: Character bit data leading address



Character height: To be assigned in terms of dot lines.

Character width: To be assigned in terms of bytes



START: Start of drawing

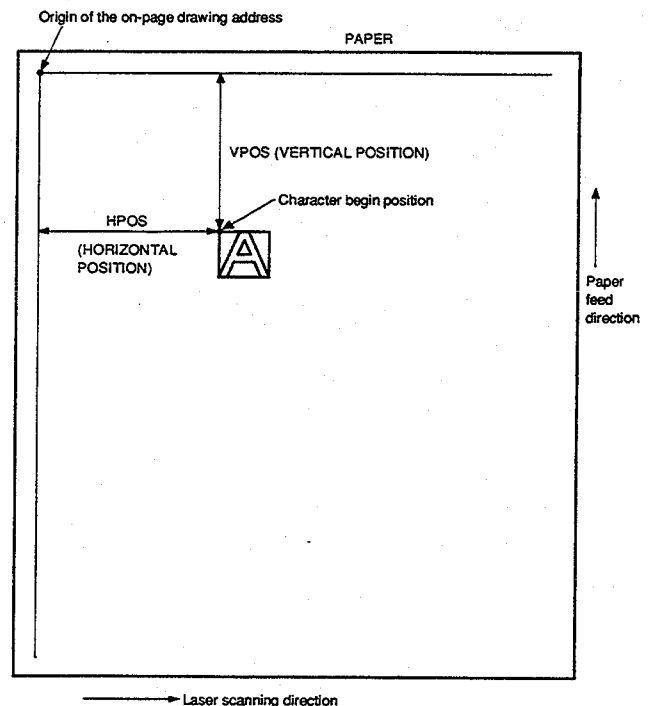
END: Last character of a page

VMAG RATE: To assign vertical magnification or reduction ratio.

HMAG RATE: To assign horizontal magnification or reduction ratio.

BOLD: To assign the character width

■ On-page address by the drawing circuit



1. CPU interfacing signals

- (1) Bidirectional data bus (D0 to D15: input/output, pin numbers 109 to 112, 115 to 121, and 123 to 127)

The bidirectional data bus, D0 to D15, is input/output signal lines provided to transfer data between the drawing processor and the processing system that includes the CPU.

D0 to D15 comprises a tri-state buffer which is at a high impedance except when the CPU access the drawing processor internal register.

- (2) Address bus (A01 to A23): input/output, pin numbers 1 to 4, 6 to 15, and 18 to 26)

Directly connected with the CPU address bus and is used for the CPU to access the user RAM area.

- (3) Read/write (R/W: input, pin number 31)

The read/write line (R/W) is an input signal line that is used to control data transfer between the drawing processor and the processing system that includes the CPU. When R/W is at a high, data is transferred to the drawing processor and when low the data is transferred from the CPU to the drawing processor.

- (4) Chip select ($\overline{CS}$: input, pin number 30)

This line is an input signal line provided for the CPU including processing system to access the drawing processor. When IPCS is at a low, the drawing processor internal register can be read and written.

- (5) Data transfer acknowledge ($\overline{\text{DTACK}}$: output, pin number 29)

DTACK is used to inform the end of data transfer. The signal is sent to the CPU by synchronizing -IPCS with the internal clock frequency.

- (6) Power-on reset ($\overline{\text{POR}}$: input, pin number 38)

Resets all internal states including the clock divider circuitry and goes into the hold state. $\overline{\text{RES}}$ must be issued to the operate the drawing processor.

(7) Reset ($\overline{RES}$, input, pin number 32)

Used to externally reset the internal state of the drawing processor to get it ready for operation. The following condition is established in the drawing processor when a low state of $\overline{RES}$ is received.

After resetting all internal states except for the clock frequency divider and all of 128 x 2560 dots ring buffer is cleared.

NOTES: ■ $\overline{RES}$ must be set low to operate the drawing processor after power on.

■ The contents of registers may not be definite at power on, except for the registers affected after the reset.

(8) Interrupt request (IRQ: output, pin number 28)

The interrupt request signal (IRQ) is an output to inform the end of command to the CPU, detection of an error status, and detection of a buffer full signal. The CPU will therefore be able to know how the previous data has been processed within the drawing circuit.

Though the system that includes the CPU may access the drawing processor while IRQ is at a low, the write data is ignored and the read data may not be established.

2. For the CPU control timing and drawing processor control timing are normally asynchronous, the CPU needs to be synchronous with the drawing processor when the CPU accesses the CG memory.

Upon the time when the address was latched by the CG memory side after the CG memory address was issued by the drawing processor, the CPU read or write the data in synchronization with the drawing processor control clock. That is, $\overline{CGCS}$ is issued to the drawing processor from the CPU. Synchronization is attained at a low to high transition of the first S4 after $\overline{CGRDY}$ was returned from the drawing processor and read/write is conducted at a rising edge of S5 and falling edge of S6.

NOTE: S4, S5, and S6 is the name given to the CPU control clock.

3. Explaining the sequence that the CPU access the CG memory

- ① At a high to low transition of the drawing processor clock G0, a row address appears in CGADR0 to 8.
- ② At a low to high transition of the drawing processor clock G1, $\overline{CGRAS}$ appears.
- ③ At a high to low transition of the drawing processor clock, a column address appears in CGADR0 to 9.
- ④ At a low to high transition of the drawing processor clock G3, -CGCASV and CGCASL are issued.
- ⑤ When $\overline{CGRDY}$ is issued from the drawing processor, synchronization is achieved at a falling edge of the CPU clock S4 and access starts from the CPU.
- ⑥ At a falling edge of the CPU clock S4, $\overline{CGOE}$ is issued and the data to be received appears on CD0 to 15, when the CPU is to read the CG memory.
- ⑦ At a falling edge of the CPU clock S6, the data are read by the CPU.
- ⑧ At a rising edge of the CPU clock S5, $\overline{CGOE}$ is issued and the write data are written in the CG memory, when the CPU is to write the CG memory.

* CGADR18 to 22 are retained during a memory cycle.

Explaining the sequence the CPU accesses the CG memory

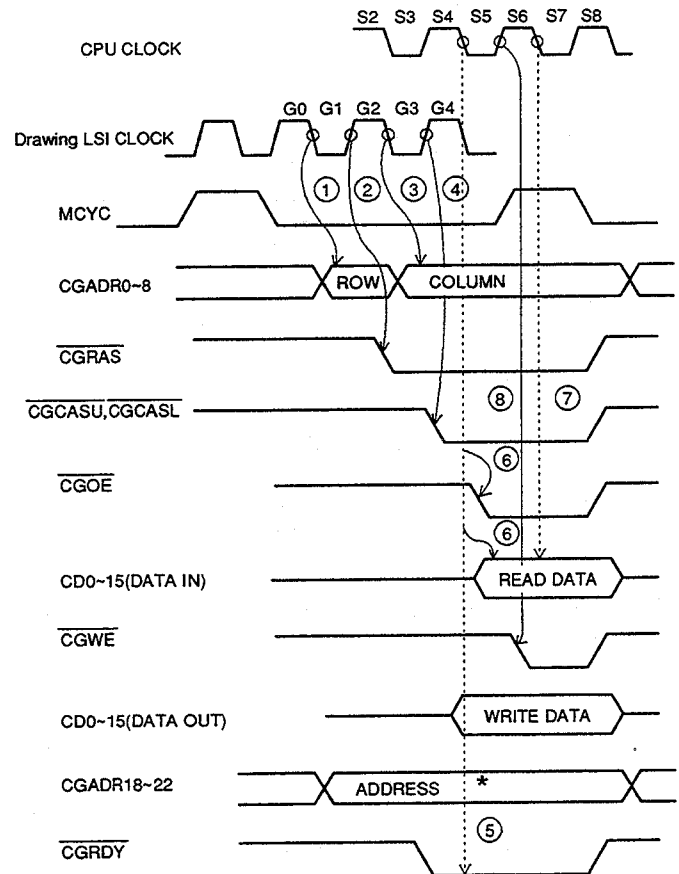


Fig.8-4-4. Timings

8-3-2. CG memory interface

The drawing circuit within the drawing processor will directly access the CG memory as shown below. Address bus and control signals to the CG memory are issued from the DRAM controller. When the drawing circuit reads the CG memory, the CPU data bus is not connected as seen from the drawing circuit, because the CG data bus side port of the bidirectional bus driver is high impedance by $\overline{OBTEN}$.

The CG memory consists of the following buses:

Address bus (CGA00 to CGA23)

Data bus (CGD00 to CGD15)

Control signals ...

$\overline{CGCS}$, $\overline{CRFSH}$, $\overline{CGRAS}$, $\overline{CGOE}$, $\overline{CGRDY}$, $\overline{OBTEN}$, $\overline{CGCAS}$, $\overline{CGWE}$

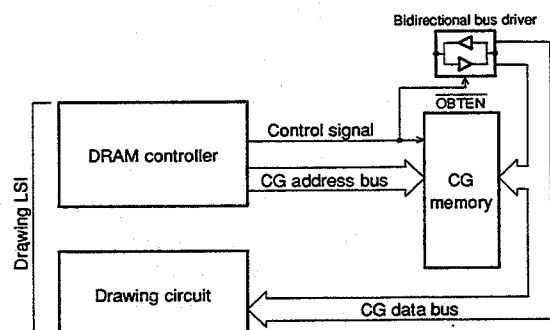


Fig.8-4-5. Interface with the CG memory

1. CG memory interfacing signals

(1) CG address (CGA00 to CGA23)

CG memory address signal which transferred the address designated by the drawing circuit, address designated by the CPU, and the refresh addressed multiplexed altogether. Those select signals are issued by $\overline{CGCS}$ and internal select signal. The high and low order addresses are sent out in synchronization with $\overline{CGRAS}$ and $\overline{CGCAS}$.

(2) CG data (CGD00 to CGD15)

The data in the CG memory are synchronization with $\overline{CGOE}$ according to the CG address.

(3) $\overline{CGCS}$, input pin number 34

This signal is used by the CPU to access the CG memory which the memory access is judged at the first state of memory cycle (MCYC). If a RAM select signal has been issued to make drawing internally (DRAW at a low), the execution is done at a cycle next to the memory cycle.

(4) $\overline{CGRDY}$, output pin number 39

ACK signal which indicates that $\overline{CGCS}$ has been accepted during the memory cycle.

(5) $\overline{CRFSH}$, output pin number 35

Used to refresh the CG memory.

(6) $\overline{OBTEN}$, output pin number 33

A bidirectional bus buffer enable signal sends the CG memory data on the CPU data bus in response to the CG memory access command from the CPU or sends the CPU data on the drawing processor.

(7) CG memory control signals

$\overline{CGRAS}$: Output pin number 36

$\overline{CGCAS}$: Output pin number 37

$\overline{CGOE}$: Output pin number 40

$\overline{CGWE}$: Output pin number 41

Those signals are connected to $\overline{RAS}$, $\overline{CAS}$, $\overline{OE}$, $\overline{WE}$ of the CG memory.

2. Explaining the sequence that the drawing processor uses to read the CG memory

① DRAW is at a low state in the cycle that the drawing processor access the drawing.

② A row and column address is sent on CGADR0 to 8 in synchronization with $\overline{CGRAS}$ and $\overline{CGCAS}$. When accessing the ROM, the low order address is latched in the external IC by $\overline{CGRAS}$.

③ The RAM data dependent to $\overline{CGRAS}$ and $\overline{CGCAS}$ is sent onto CGDATA00 to 15 by $\overline{CGOE}$.

** CGADR18 to 23 is retained during the drawing access cycle.

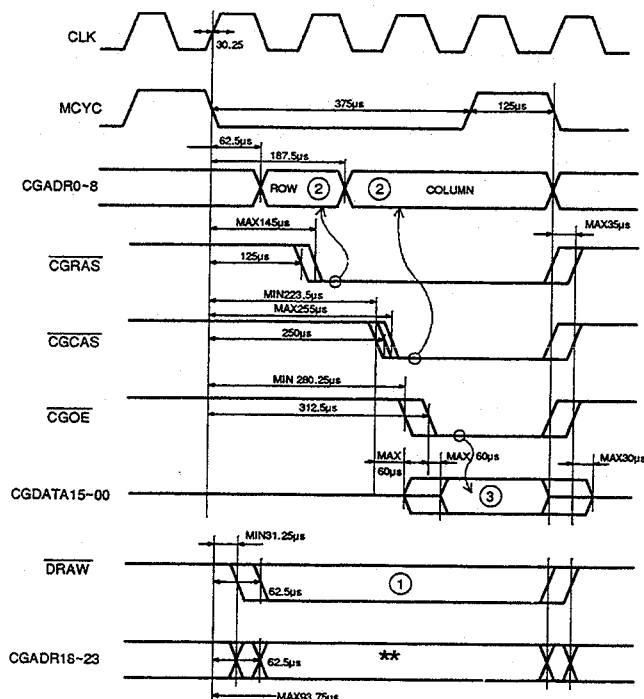


Fig.8-4-6. Timings

* Drawing access cycle: Indicates the period that the drawing processor access the CG memory. DRAW is at a low level during this cycle.

8-3-3. Ring buffer interface

The ring buffer is a video memory that consists of 2560 x 128 dots and is directly connected to the drawing processor. The ring buffer can be read and written in synchronization with a signal from the drawing circuit.

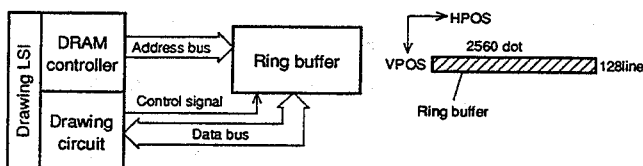


Fig.8-4-7. Interfacing with the ring buffer

The ring buffer interface consists of the following buses:

Address bus (T0 to T7)

Data bus (RD0 to RD7)

Control signal ($\overline{RRAS}$, $\overline{RCAS}$, $\overline{ROE}$, $\overline{RWE}$)

1. Interfacing signals with the ring buffer

(1) Memory cycle (MCYC: output, pin number 27)

Memory cycle signal is an output that indicates access cycle to the user RAM and ring buffer by the drawing processor.

(2) $\overline{OBTEN}$ ($\overline{OBTEN}$: output, pin number 33)

An output signal that controls the data transfer between the CPU and the memory, when the CPU read/write the memory. The drawing processor cannot accept memory read/write by the CPU while the internal drawing circuit is in operation (DRAW at a low level), but the memory data can be sent on the data bus by $\overline{OBTEN}$ when DRAW is at a high.

(3) Draw ($\overline{\text{DRAW}}$, output, pin number 42)

The signal $\overline{\text{DRAW}}$ is an output signal that indicates whether the drawing processor is in the drawing accessing cycle or CPU accessing cycle.

With a low state of $\overline{\text{DRAW}}$, the drawing processor is in the drawing accessing cycle so that CGA is sent on the drawing address.

NOTE: $\overline{\text{DRAW}}$ can be at a low level only when the drawing processor is in the drawing accessing cycle.

(4) Ring buffer data (RD00 to RD07)

Ring buffer data is in the 8-bit structure and is in the state that the CG data was processed by the drawing processor (after the word to byte conversion, enlarge, or reduce).

(5) Ring buffer address (RA00 to RA07)

Directly connected with the ring buffer address bus and is used to access the ring buffer by the drawing circuit.

(6) Ring buffer control signals

$\overline{\text{RRAS}}$: Output, pin number 98, RAS signal connected to the ring buffer

$\overline{\text{RCAS}}$: Output, pin number 99, CAS signal connected to the ring buffer

$\overline{\text{ROE}}$: Output, pin number 100, read signal to the ring buffer.

$\overline{\text{RWE}}$: Output, pin number 97, write signal to the ring buffer

2. Explaining the sequence that the drawing processor accesses the ring buffer

- ① At a low to high transition of R0 of CLK (16MHz), row address is sent on T0 to T7.
- ② At a low to high transition of R2 of CLK (16MHz), $\overline{\text{RRAS}}$ is issued.
- ③ At a low to high transition of R3 of CLK (16MHz), column address is sent on T0 to T7.
- ④ At a low to high transition of R4 of CLK (16MHz), $\overline{\text{RCAS}}$ and $\overline{\text{ROE}}$ are issued.
- ⑤ Data to be read is sent on P0 to P7, when $\overline{\text{RCAS}}$ is issued, for the drawing processor to read the contents of R6 of the ring buffer.
- ⑥ Data is sent to the drawing processor at a low to high transition of R6 of CLK (16MHz).
- ⑦ Write data is sent on P0 to P7, when $\overline{\text{RCAS}}$ is issued, for the drawing processor to write data in the ring buffer.
- ⑧ $\overline{\text{RWE}}$ is issued at a low to high transition of the clock R6 (16MHz) to write data in the ring buffer at a rising edge of R8.

Ring buffer timing (read and modify write)

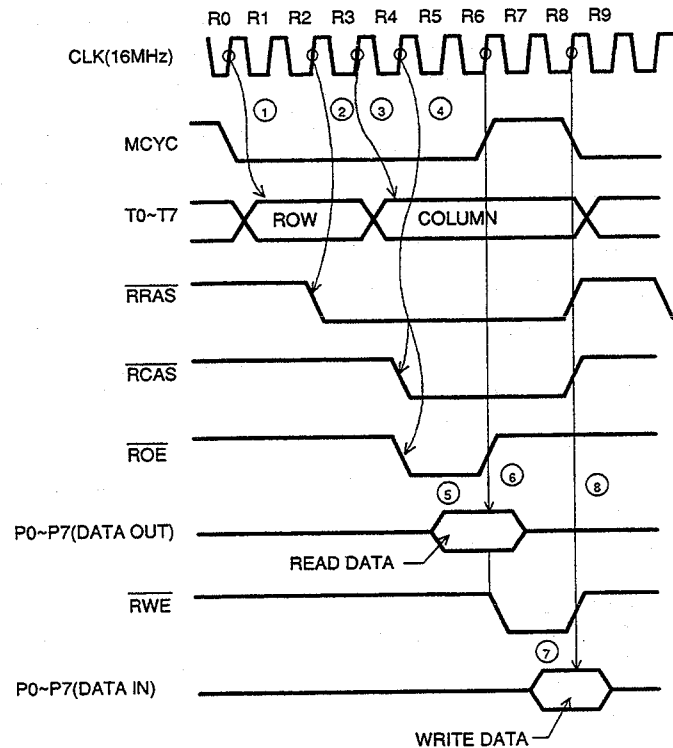


Fig.8-4-8. Timings

8-3-4. Printer interface signals

(1) $\overline{\text{PAGE}}$: Input, Pin No. 105

This signal is to command the PCU to start printing, and is kept LOW while one-page data is transmitted.

When the PCU receives this signal, it starts the printing operation (if there is no error.)

(2) $\overline{\text{CLK}}$: Input, Pin No. 106

This is a clock signal synchronizing for every one dot (one video data), sent from the PCU. The drawing circuit is synchronized with this clock signal to transmit video data to the printer engine.

(3) $\overline{\text{HSYNC}}$: Input, Pin No. 107

This is a synchronizing signal for every one line, sent from the PCU. In synchronization with this signal, video data are transmitted for every one line.

(4) PDATA:

Output, Pin No. 101

Video data to be transmitted to the PCU.

8-4. Interface LSI peripherals

• General

The interface LSI (CF78057) is an LSI of about 6000 gates having a timer, a PIO, and two SIO's. It has 120-pin QFP to control the CPU, interface, and memories.

The LSI is divided into five blocks: the interface circuit, the timer circuit, the interrupt circuit, the memory select circuit, and the CPU control circuit.

The interface circuit supports the Centronics interface, RS232C interface, and PCU interface. The Centronics interface and the PCU interface include drivers.

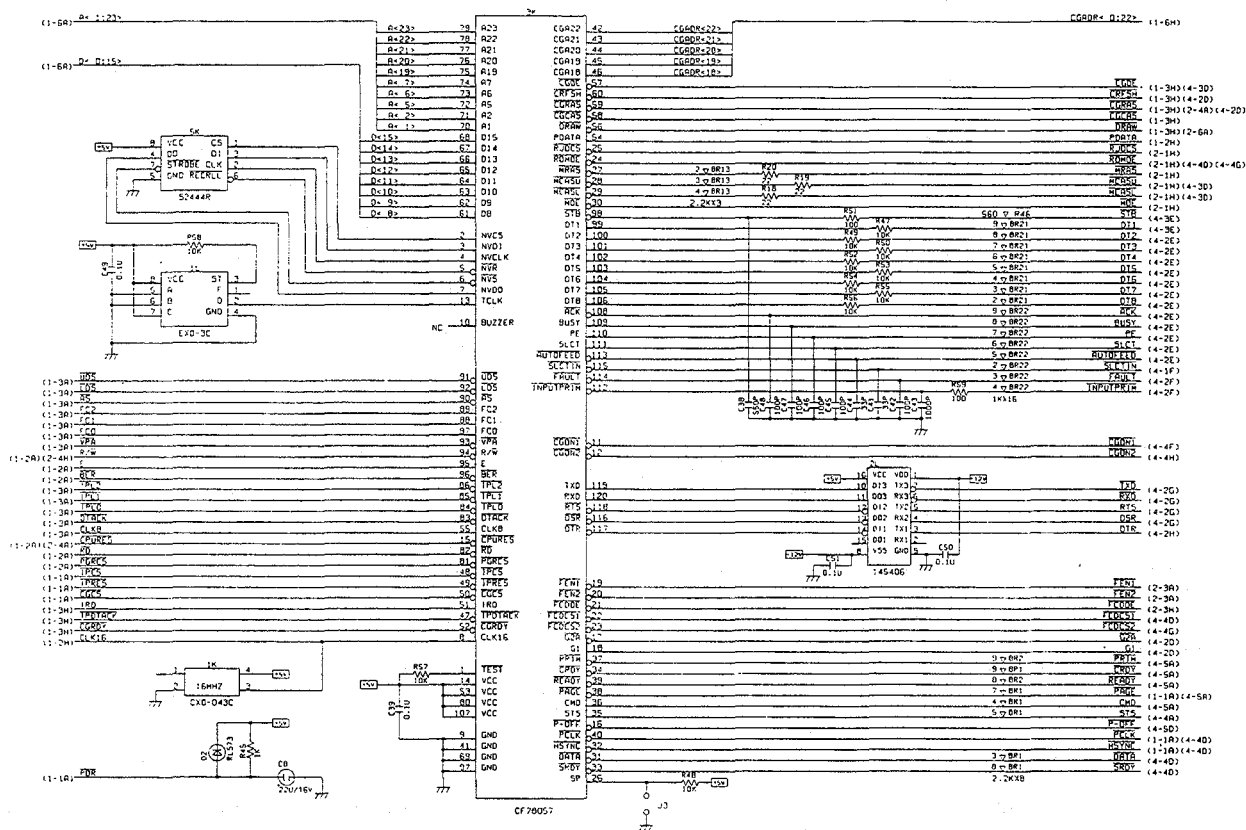
The timer circuit is used to set baud rate of the PCU interface and RS232C interface and to control the soft timer and scanning width.

The interrupt circuit provide 3 interrupt lines to the CPU which will encode interrupt level (INT 0~7).

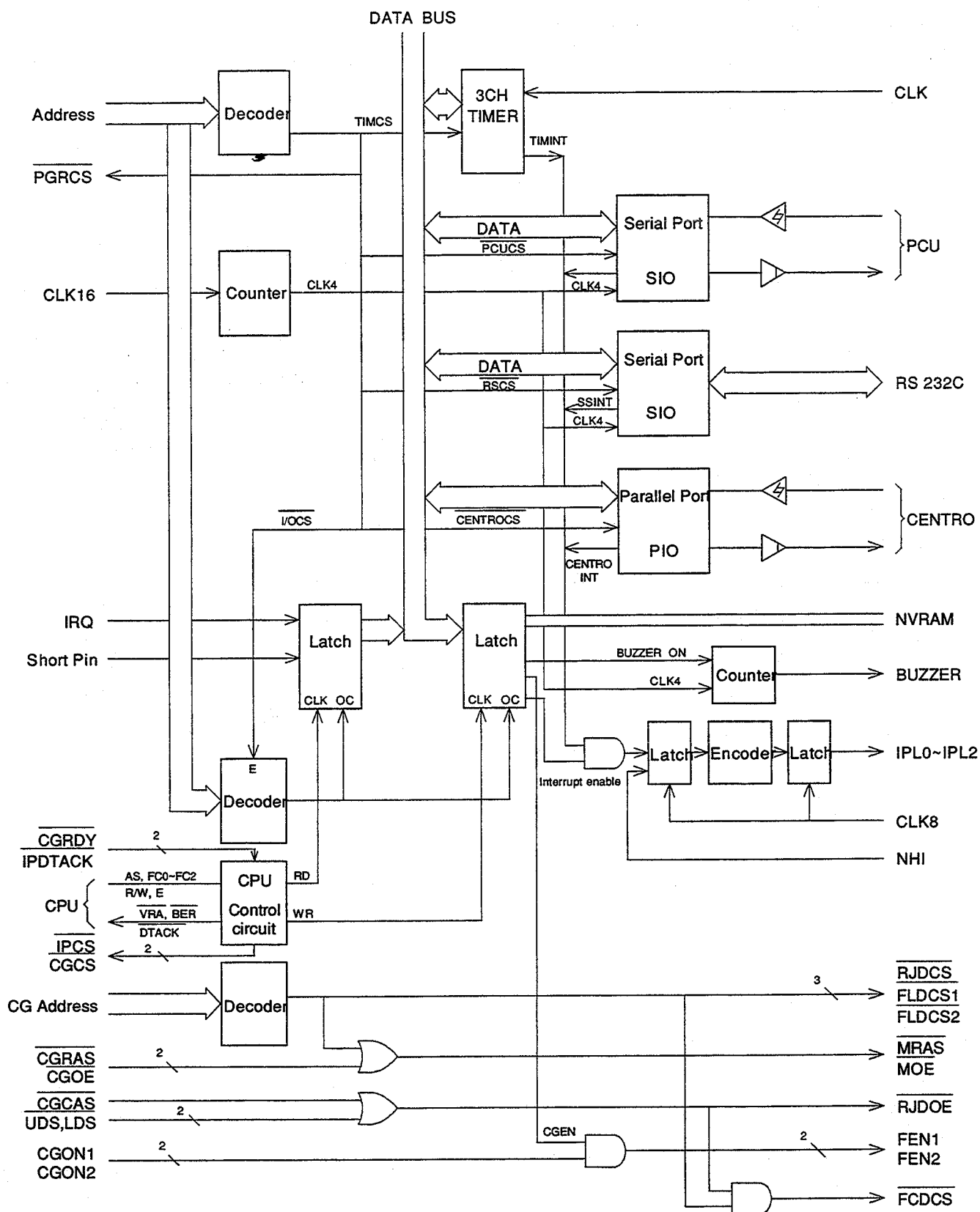
The memory select circuit decodes the address and generates chip selection for the resident font memory, the font card, the user memory and the expansion memory, etc.

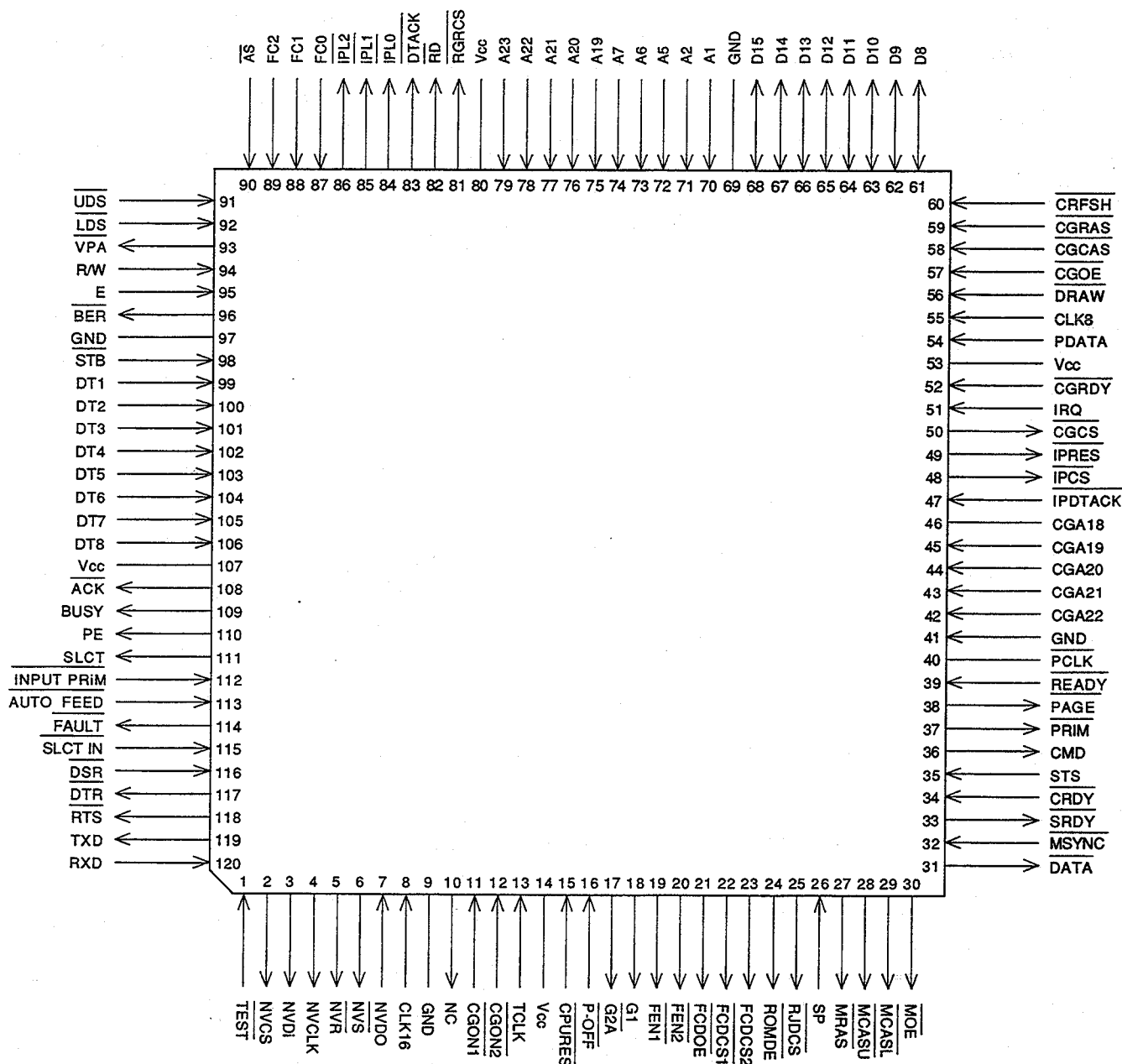
The CPU control circuit allows connection with the CPU, and generates VPA, bus error (BER), and data acknowledge signal (DTACK).

8-4-1. I/F LSI bus connection



I/F LSI Block diagram





8-4-3. TIMER

THE TIMER has three channels of the timer counter, each one of these channels has the following usage.

- (1) Channel 0 operates in rate generation mode which is used to set the RS232C serial data transmission baud rate.
Baud rate is created after dividing an input clock of 614.4KHz.
- (2) Channel 1 operates in counter complete interrupt mode which is used for an interval timer interrupt at every 6ms.
- (3) Channel 2 operates in the rate generation mode which is used for counting of the PCU interface sync clock.
The count number of sync clock is determined by the scanning width. The print width is set by using the output signal after counting as flip-flop clock.

* Rate generation mode:

Clock is obtained by dividing the input clock whose dividing factor is assigned by a command from the CPU.

* Counter complete interrupt mode:

By counting down the basic clock from the counters default value, an interrupt is caused when the counter value becomes 0.

8-4-4. Centronics interface

The Centronics interface is provided for interface with an external host device. The interface circuitry consists of an PIO general I/O device. Port A of the PIO is assigned to the data bus input port from the host. Port B of the PIO is assigned to the output port for transfer of control signal to the host. Port C is assigned to the input port, except for PC3 and PC5 which is used for control signal port from the host. The data bus lines on the CPU side are directly connected to the CPU data bus to allow direct accessing by the CPU.

8-4-4-1. Signal description

- (a) **STB** (input, low active)
Sync signal used to read data.
- (b) **DATA1 to DATA8** (input)
Represents information from the first to eight bits.
- (c) **ACK** (input, active low)
Acknowledge to STB input which is received when data input is terminated.
This signal is also issued when BUSY turns from high to low during initialization.
- (d) **BUSY** (active high, output)
Indicates that data input is not enabled.
This signal is issued in one of the following:
- During processing of the receive data
 - During initialization
 - During alarm
 - When the buffer is full.
- (e) **PE** (output, active high)
This signal is issued when a paper empty exists.
- (f) **SELECT** (output, active high)
High when in the on-line mode and low in the off-line mode.
On-line mode is established in one of the following:
- Upon completion of initialization
 - When the ONLINE switch is pressed in the off-line mode.
- NOTE: On-line mode would not be established in the alarm mode for the above (i) and (ii).
- On-line mode is established in one of the following:
- When the ONLINE switch pressed in the off-line mode.
 - When in the alarm.
- (g) **INPUTPRIM** (input, active low)
It goes into the initialization mode when this signal is received.
- (h) **FAULT** (output, active low)
This signal is issued when in the alarm mode.
It goes into the off-line mode when this signal is issued.

8-4-4-2. Data receiving flow

Explanation of the Centronics interface data receive flow

- The host sets up DATA8 to DATA1 and asserts -STB.
- At a leading edge of STB, BUSY is returned to the host.
- At a trailing edge of STB, the interrupt signal $\overline{\text{CEINT}}$ is asserted to inform the CPU that there was a data reception.
- At a trailing edge of STB, data is latched in the data receive latch.
- Awaits with $\overline{\text{CEINT}}$ until the CPU recognizes it.
- As the CPU recognizes the interrupt, $\overline{\text{CEINT}}$ is negated and the data is read in the receive latch.
- At the moment it became enabled to receive the next data, -ACK is asserted to request the next data.
- After negating ACK, BUSY is negated and a single byte receive sequence terminates.

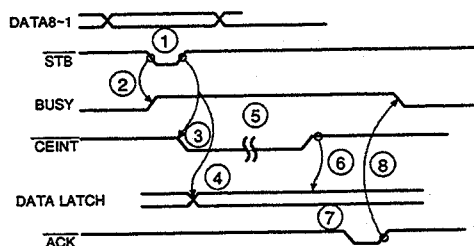
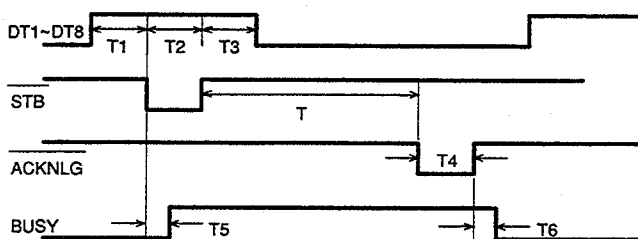


Fig.8-6-2. Receiving flow

8-4-4-3. Centronics interface timings

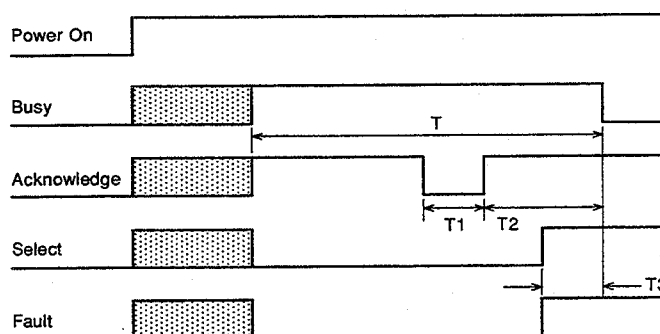
The Centronics interface timings can be selected with the operation panel.

TIMING 1 (DATA TRANSFER STANDARD TIMING) (Centronics MODEL 703)



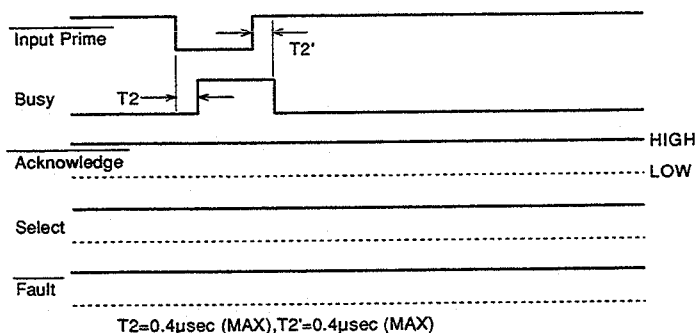
T1: 0.5 μs (min)	T4: 2.5 μs (min)
T2: 0.5 μs (min)	T5: 1.0 μs (max)
T3: 0.5 μs (min)	T6: 25 μs (max)
	T: Program Loop Time

Power On Standard Parallel Interface Timing



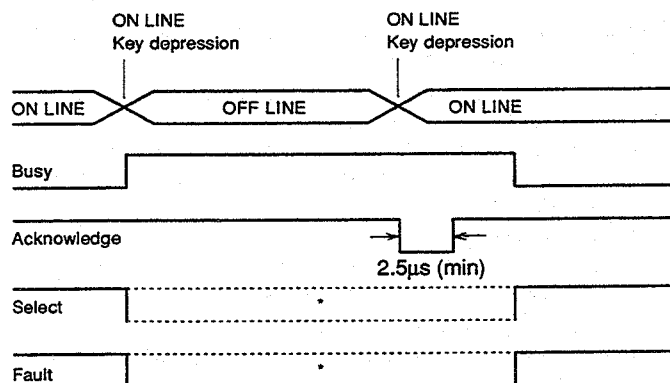
T1: 2.5 μs (min)	T3: 0.0 μs (min)
T2: 25 μs (max)	T: Initializing Time

Input Prime Timing Standard Parallel Interface Timing



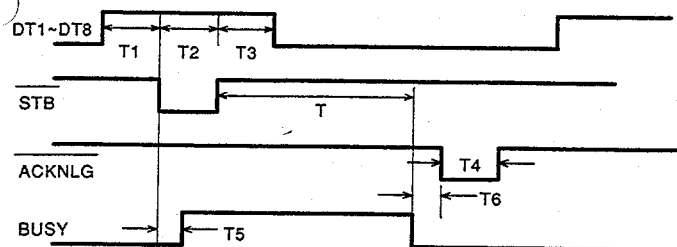
T2=0.4 μsec (MAX), T2'=0.4 μsec (MAX)

ONLINE/OFFLINE Selection Standard Parallel Interface Timing



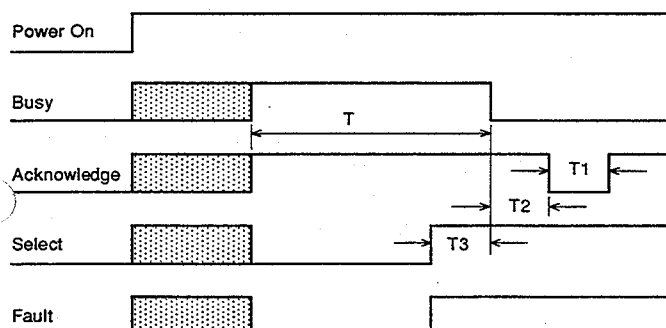
* May differ depending on emulation

TIMING 2 (DATA TRANSFER ALTERNATE TIMING)



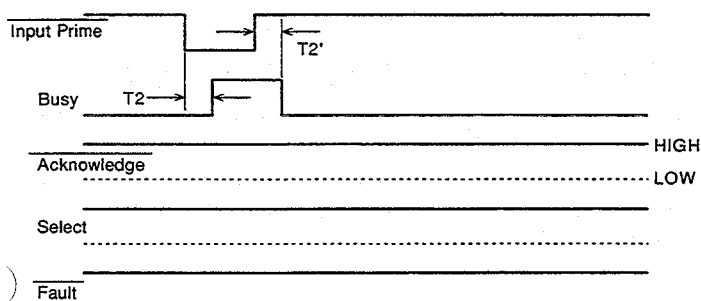
T1: 0.5 μ s (min) T4: 2.5 μ s (min)
T2: 0.5 μ s (min) T5: 1.0 μ s (max)
T3: 0.5 μ s (min) T6: 25 ns (min)
T: Program Loop Time

Power On Alternate Parallel Interface Timing



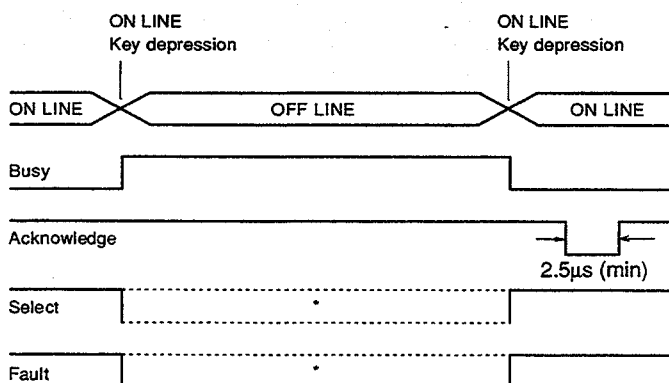
T1: 2.5 μ s (min) T3: 0.0 μ s (min)
T2: 50 ns (min) T: Initializing Time

Input Prime Timing Alternate Parallel Interface Timing



T2=0.4 μ sec (MAX), T2'=0.4 μ sec (MAX)

ONLINE/OFFLINE Selection Alternate Parallel Interface Timing



* May differ depending on emulation.

Fig.8-6-3. Centronics interface timing

8-4-4. Interfacing signals

The Centronics Parallel interface consists of a 36 pin connector.

The signals on the 36 pin interface connector are:

Pin	Signal Name	Pin	Signal Name
1	STB	19	STB Ret
2	DATA 1	20	DATA 1 Ret
3	DATA 2	21	DATA 2 Ret
4	DATA 3	22	DATA 3 Ret
5	DATA 4	23	DATA 4 Ret
6	DATA 5	24	DATA 5 Ret
7	DATA 6	25	DATA 6 Ret
8	DATA 7	26	DATA 7 Ret
9	DATA 8	27	DATA 8 Ret
10	ACKNLG	28	ACKNLG Ret
11	BUSY	29	BUSY Ret
12	PE (Paper End)	30	PE Ret
13	SLCT	31	INPRM
14	AUTO LF	32	FAULT
15	NC	33	GND
16	GND (0V)	34	NC
17	Frame Ground	35	+5V
18	NC	36	SLCT IN

8-4-5. RS232C interface

8-4-5-1. Specifications

Communication: Start/stop mode ...Asynchronous

Baud rate: 300, 600, 1200, 2400, 4800, 9600, 19,200 bps

Transmission: Full duplex

Synchronization: Start bit ... 1
Stop bits ... 1
Data bits ... 8
Internal clock synchronization

Error detection: Parity is not used

8-4-5-2. Interfacing signals

The interface connector signal table and the connector for RS232C interface is shown in Table 8-7.

Table 8.7 RS232C Signal

NO.	SIGNAL
1	FG (Frame Ground)
2	TXD (Transmitted Data)
3	RXD (Received Data)
4	RTS (Request to Send)
6	DSR (Data Set Ready)
7	GND (Signal Ground)
20	DTR (Data Terminal Ready)

Outline View of Interface Connector

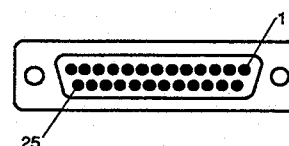


Fig. 8.7.1 DDK 17LE-1325C-28 (device side)

8-4-5-3. Description of RS232C interface signals

Transmitted Data ($\overline{\text{TXD}}$)

Printer output. Data from the printer to the computer.

Received Data ($\overline{\text{RXD}}$)

Printer input. Data from the computer to the printer.

Request To Send (RTS)

Printer output. This signal is high when there is power on in the printer.

Data Set Ready ($\overline{\text{DSR}}$)

Printer input. This signal is not required for controller to receive data.

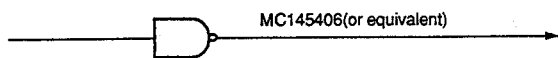
Data Terminal Ready (DTR)

Printer output. High signal indicates that the printer is ready and low signal indicates that the printer is busy.

8-4-5-4. Signal levels at RS232C interface

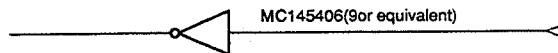
Transmit

Signals: $\overline{\text{TXD}}$, DTR, RTS



Receive

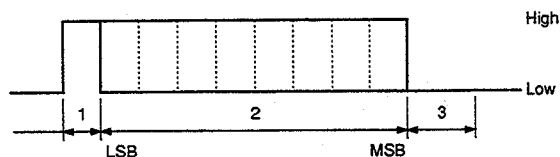
Signals: $\overline{\text{RXD}}$, DSR



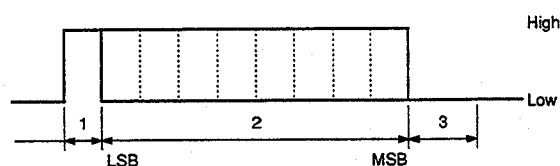
Receive signal level: High ...+3 to +15V
Low ...-15 to -3V

Transmit signal level: High ...+3 to +15V
Low ...-15 to -5V

Transmit data: $\overline{\text{TXD}}$



Receive data: $\overline{\text{RXD}}$



1. Start bit
2. 1-byte data
3. Stop bit(s)

8-4-5-5. Serial interface protocol

Data Terminal Ready

A hardware handshake is available with the printer. The Data Terminal Ready (DTR) signal line is available for hardware handshake at pin 20 of the serial connector. This signal line is always operating, it does not require enabling.

The DTR signal line indicates whether the printer is "ready" or "not ready" for data. When the printer is ready for data, the DTR signal switches to a High (or low, if the DTR line is set for inverted operation). The printer will request data when the following three conditions exist:

1. when its 10K byte buffer has less than 6K bytes of data (has at least 4K bytes empty),

2. when it is ON-LINE, and
3. when it is not BUSY.

The DTR signal goes Low (high, if the DTR line is set for inverted operation) when the printer is not ready to accept data. Data will not be accepted by the printer when any one of the following conditions exist:

- ★ the I/O buffer has 450 bytes empty,
- ★ it is OFF-LINE, or
- ★ it is in a BUSY state (such as performing Self-Test).

Transitions on the line correspond to the transmissions of Xon (asserted) and Xoff (not-asserted).

The signal logic or "sense" of the DTR signal line can be switched to either active high or active low from the operator panel on the printer. To select the DTR line for active high polarity select DTR POLARITY=HI* using the Printer Operator Panel configuration menu; to select active low polarity set the configuration menu item to DTR POLARITY=LO*.

Xon/Xoff

Xon/Xoff is a data stream handshake protocol which sends Xon (DC1; 11hex) to the computer when the printer is able to accept data and sends Xoff (DC3; 13hex) when the printer is not ready for data.

The printer transmits an Xon when it is ready to accept more data from the host. The printer requests data when the following three conditions exist:

1. when its 10K byte buffer has less than 6K bytes of data (has at least 4K bytes empty),
2. when it is ON-LINE, and
3. when it is not BUSY.

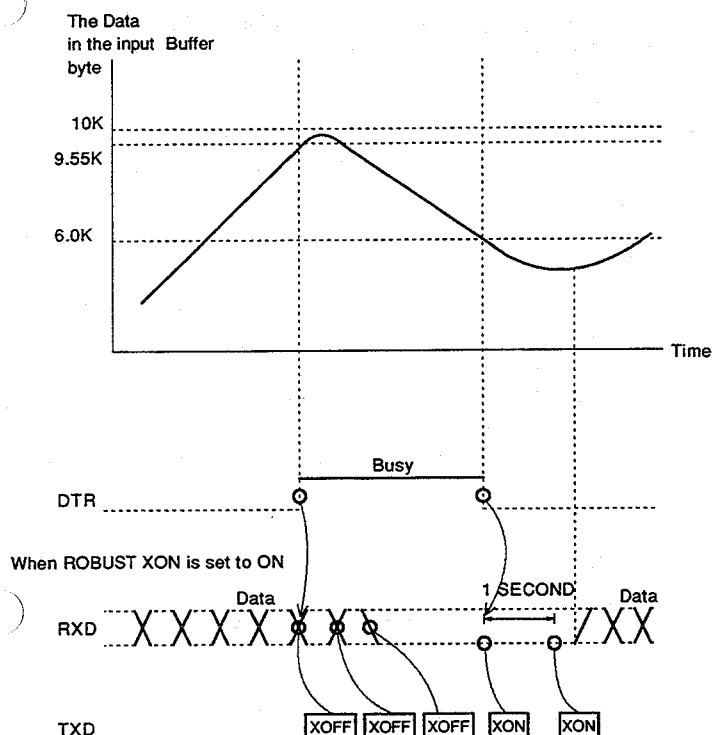
If not data is received within approximately one second of the transmission of an Xon, the printer may be configured so that it sends additional Xon's at one second intervals until data is received. The ROBUST-XON operator Panel configuration menu item is used to select whether additional Xon's should be transmitted. If ROBUST-XON is set to On, additional Xon's will be transmitted at one second intervals until data is received. If ROBUST-XON is set to off, additional Xon's are not transmitted. The factory setting is ROBUST-XON set to On.

Xoff's are transmitted by the printer to indicate that the printer is not ready to accept data. An Xoff is transmitted when any one of the following conditions exist:

- ★ the I/O buffer has 450 bytes empty,
- ★ it is OFF-LINE, or
- ★ it is in a BUSY state (such as performing Self-Test).

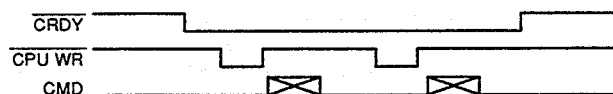
If additional data bytes are received from the host after the Xoff is transmitted, additional Xoff characters are transmitted everytime it receives additional data. Also, an Xoff is transmitted as soon as the Message Display changes to WARMING UP when the printer is powered on.

Timing Chart

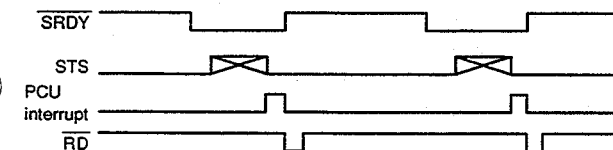


8-4-6. PCU interface

The PCU interface is composed of the SIO and drivers (input: Schmitt-trigger, output: Open drain). Communication is made at 9600 baud.



When the PCU drives $\overline{\text{CRDY}}$ to LOW, CMD data are transmitted according to the baud rate.



When the PCU drives $\overline{\text{SRDY}}$ to LOW, the PCU transmits STS. When one byte of STS is transmitted, PCU interrupt is applied and the PCU reads STS data.

8-4-6-1. PCU interface signals

- (1) $\overline{\text{READY}}$
When at LOW, the PCU shows print enable state.
- (2) $\overline{\text{PAGE}}$
Print start signal to the PCU.
- (3) $\overline{\text{PRIM}}$
Initialize request signal to the PCU.
- (4) $\overline{\text{CRDY}}$
Command request signal from the PCU.
- (5) $\overline{\text{SRDY}}$
Status request signal to the PCU.
- (6) $\overline{\text{CMD}}$
This signal allows transmission of command data to the PCU.
- (7) $\overline{\text{STS}}$
This signal allows reception of status signal from the PCU.

8-4-7. Interrupt

The interrupt circuit controls six interruptions: P-OFF (NMI), RS232C interrupt, timer interrupt, PCU interrupt, IRQ interrupt, and Centronics interrupt.

The five interruptions excepting P-OFF (NMI) can be masked by making enable signals at interrupt enable port (OUT 180060H) LOW, and can be made enable by making them HIGH. Interruption conditions of IRQ, Centronics, RS232C, and timer can be checked by reading the interrupt sense port (IN 180060H).

The interruption mask-gated by the interrupt enable signal is assigned according to the interrupting level by the decoder and connected to the CPU as interrupt code of IPL0 ~ IPL2.

To assure the reception of the decoded interrupt code by the CPU, the CLK (8MHZ) of the CPU is synchronized with the code.

8-4-8. CPU control

8-4-8-1. Interrupt acknowledge

Since interrupt process is performed with setting to auto vectoring, VPA is made enable only when all function codes (FC0-FC2) are HIGH in the interrupt acknowledge state.

8-4-8-2. Watch dog timer

E clock is counted during the CPU $\overline{\text{AS}}$ is at low. When it reaches about 5us, it is judged as abnormal bus cycle, and $\overline{\text{BER}}$ is generated.

8-4-9. Memory select

The memory select circuit decodes address A19 ~ A23 from the CPU to select PCU, TIMER, RS232C interface, Centronics interface, Program interface, and I/O port.

CG addresses 18 ~ 22 from the gate array are decoded to select each memory, user RAM, resident ROM, font card 1, font card 2, and expansion memory.

9. Basic software configuration

9-1. General

Software interprets the coded data received from the host to create drawing database. Printing can take place upon completion of preparing the drawing data of a page.

The main routine consists of the following:

- ① Initial task
- ② Format task
- ③ Print task

General flow of the main routine is shown in Fig.9-1-1.

Table 9-1-1 shows the major functions of main routine tasks.

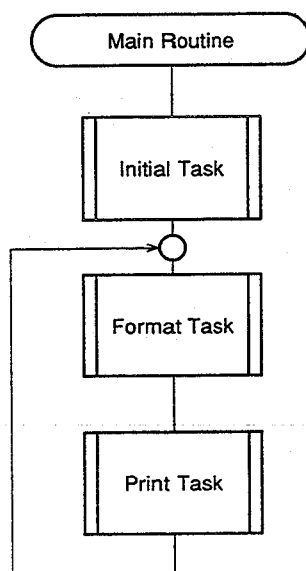


Fig. 9-1-1 General Flow

	Major functions
Initial Task	Resets flags and I/O port at power on.
Format Task	Interprets the input data and creates the database.
Print Task	Starts printing upon completion of creating a pageful database.

Table 9-1-1. Main routine functional description

9-2. Explaining routines

9-2-1. Initial task

The following describes the major functions.

- ① Work RAM area initialization
- ② I/O port initialization
- ③ Memory check
- ④ Program routine initializations

9-2-2. Format task

The following describes the major functions.

- ① Reads data from the input buffer.
- ② The data is interpreted based on the emulation to create a 5-word drawing database.
- ③ The drawing database is stored in the RAM.
The input buffer is a memory area which temporarily stores the input data before the data is interpreted.

9-2-3. Print task

Upon the completion of creating a page drawing database, the printer is started. Data transfer from the user RAM area to the drawing circuit is done by means of an interrupt by the drawing circuit.

9-2-4. Others

The following are provided as a handler and interrupt routine.

1. Handler

- ① RS232C interface handler
- ② Centronics interface handler
The above two store the data received from the host in the input buffer.
- ③ NVRAM handler
The data is stored and retained even if the power is turned off.
- ④ PCU interface handler
By monitoring the state of the print engine, control signal required to print control is sent.

PCU: Process Control Unit

2. Interrupt

- ① NMI routine
Interrupt is issued when the power is turned off and the data is saved in the NVRAM.
- ② RS232C I/F Interrupt
Interrupt from the RS232C interface which is used to inform that data has been received. In this timing, the CPU begins to read the received data.
- ③ TIME interrupt
Interrupt from the interval timer which is used as a soft timer basic clock.
- ④ PCU interrupt
Used to judge the engine errors (DO, PJ, etc.) or display the key interruption and perform the internal process when the interrupt signal from the printer engine is received.
- ⑤ IRQ interrupt
Drawing database is written in the drawing circuit when a drawing interrupt is received.
- ⑥ Centronics I/F interrupt
Interrupt from the Centronics interface which is used to inform that data has been received. In this timing, the CPU begins to read the received data.

9-3. Drawing database

9-3-1. Download font, internal font, cartridge font

As shown, a drawing database of one character consists of five words.

Font No.		
Link Address		
H MAG	H POS	
V MAG	V POS	
DIVIDE	BOLD	CATA (RELATIVE)

Font number: Used to specify kind of fonts used. Those represented by ID number in the font list are used. It can be chosen from 00 to 6F, hex.

Link address: Used to connect the present database with a next database and contains the address of the database to be printed next.

HPOS, VPOS: Indicates the absolute location mapped on the paper under the resolution of 300 dpi (in terms of dots).

H MAG: Represents the horizontal enlarge/reduce.

V MAG: Represents the vertical enlarge/reduce.

Parameter

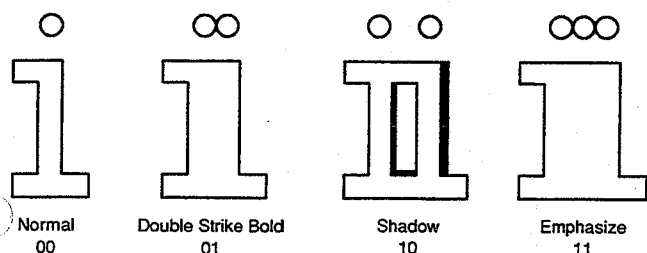
Magnification ratio	1/2	1/1	2/1	3/1
HMAG	08H	00H	01H	02H

Parameter

Magnification ratio	1/2	1/1	2/1	3/1	4/1
VMAG	08H	00H	01H	02H	03H

Bold: Specifies the character width.

	Normal	Double Strike bold	Shadow	Empha size
Bold	00H	01H	10H	11H

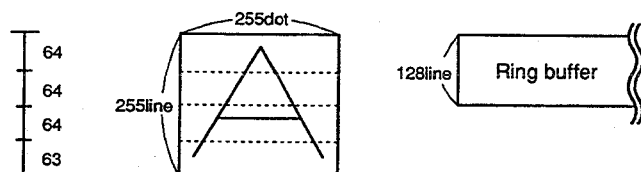


Any character can be enlarged, reduced, or boldfaced to print.

CATA (absolute): Indicates the top address of the character access table where contained character fonts assigned by the font number.

DIVIDE: A large character is divided so as to be written into the ring buffer, and the numbe of division of the character is specified. The output to the ring buffer is max. 64 lines. In the example below, the number of division is "DIVIDE 04".

Example: Font of 255 dots



9-3-2. Bit image

Font No.	Link Address
HMAG	HPOS
VMAG	VPOS
V-Volume	H-Volume
Bit image data	

A bit image drawing database consists of five words plus n-words as shown above.

Font number: In the case of a bit image, the front number is fixed to DF hex.

Link address: database and contains the address of the database to be printed next.

HPOS, VPOS; Indicates the bit image starting absolute location mapped on the paper under the resolution of 300 dpi (in terms of dots).

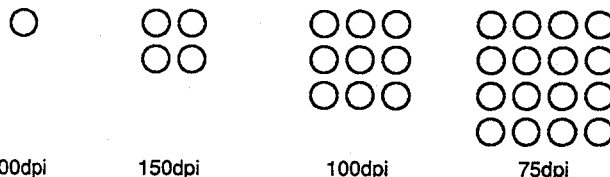
V-volume, H-volume: Represents the size of a big image in the vertical and horizontal directions.

HMAG: Represents horizontal enlarge.

VMAG: Represents vertical enlarge.

Image enlarge parameter

	300dpi	150dpi	100dpi	75dpi
HMAG	00(H)	01(H)	02(H)	03(H)
VMAG	00(H)	01(H)	02(H)	03(H)



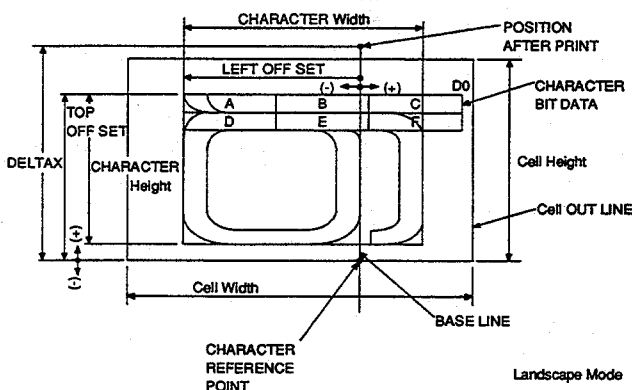
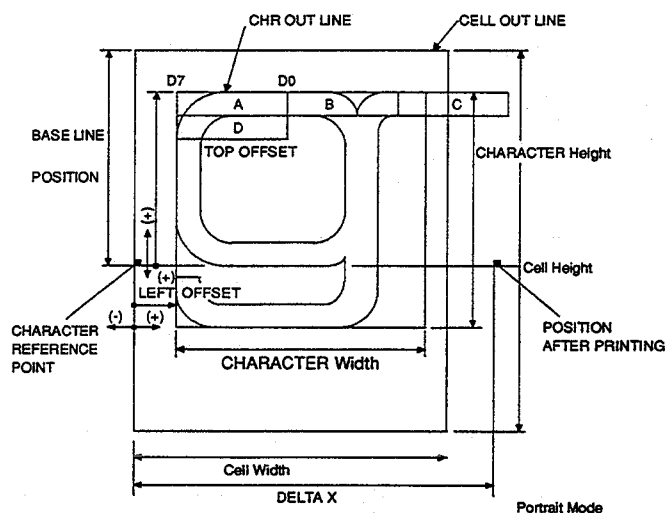
9-4. Definition of font

There are three kinds of fonts; internal, soft, and cartridge fonts.

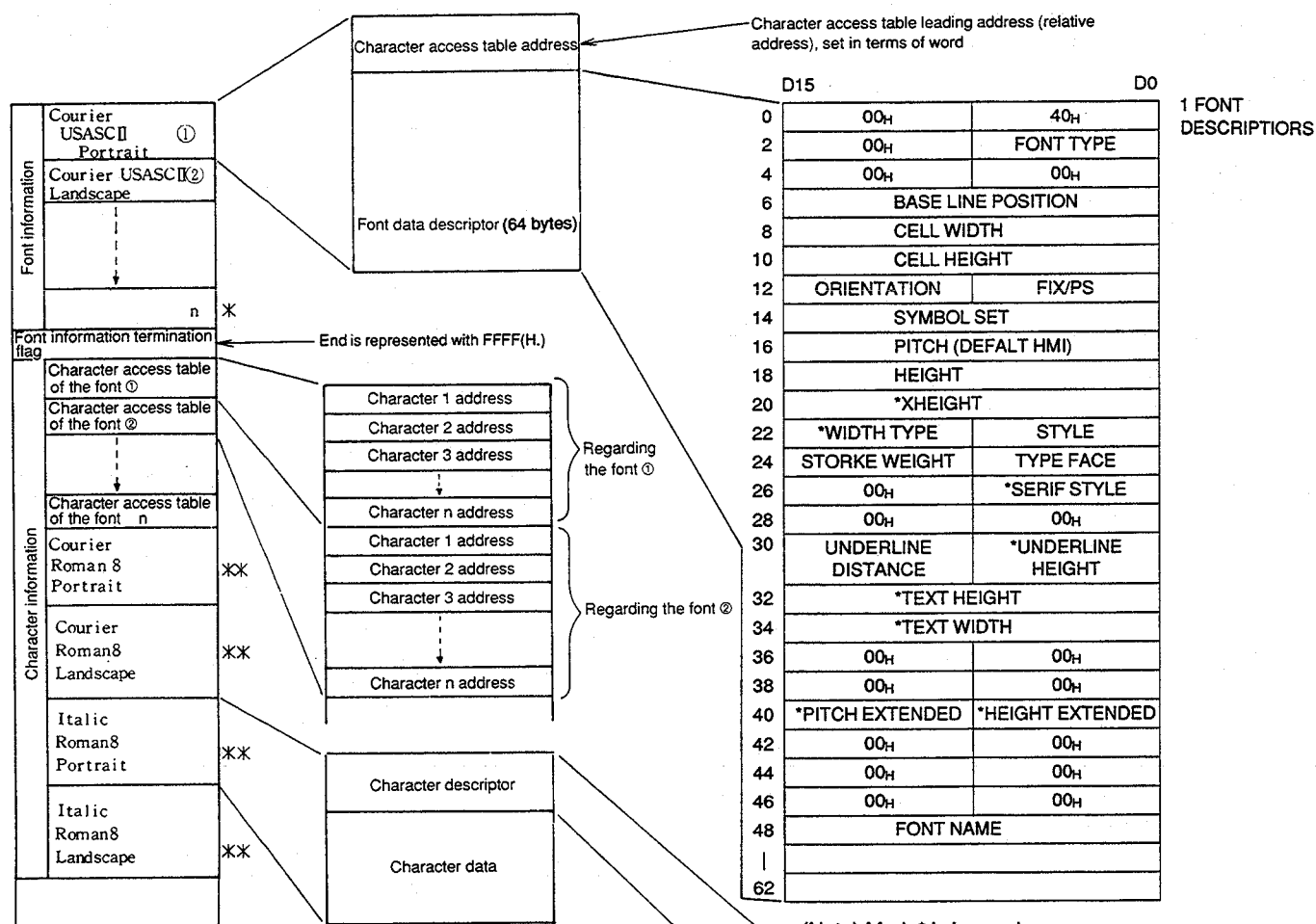
The internal font may be contained within the ROM area or automatically stored in the user RAM area at power on.

9-4-1. Character configuration

All characters are in the CG cell based on the reference point. This format is common to all emulation modes supported by the JX-9500.



9-4-2. Internal font configuration



Basically, font information and character information are stored in the CG ROM.

Convering all fonts listed in the font list, information for ① character access table address (lading address where character access table is stored), ② name of font, and ③ font descriptor are stored regarding (i) courier USASCII portrait, (ii) courirer USASCII landscape, and (iii) courier Roman8 portrait.

Character information contains the address code where characters are stored in a particular font, each font followed by the character descriptor and the character data.

See below for the relationship of the character descriptor and character data vs. print pattern.

LEFT OFFSET	TOP OFFSET	Character descriptor
CHR.Height	CHR.Width	
DELTA	x	Character data
A	B	
C	D	

LEFT OFFSET	TOP OFFSET
CHR.Height	CHR.Width
DELTA	x
A	B
C	D

9-4-3. Download font configuration (on user RAM)

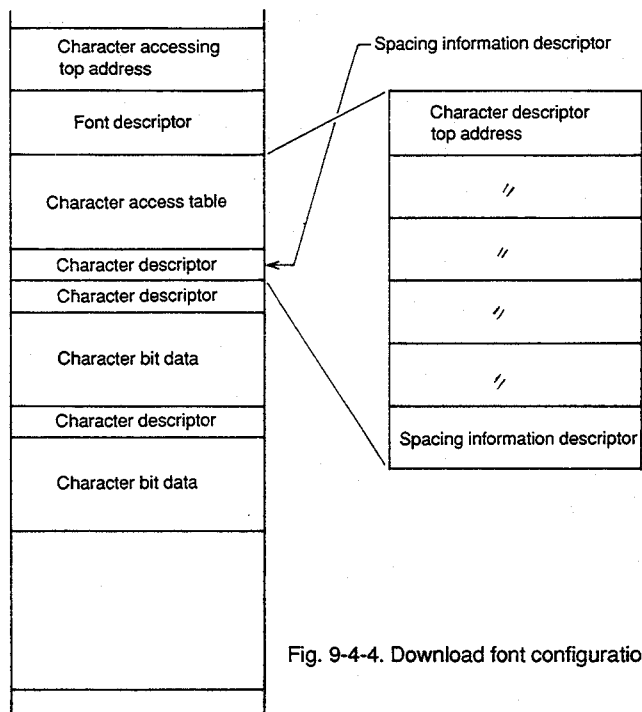
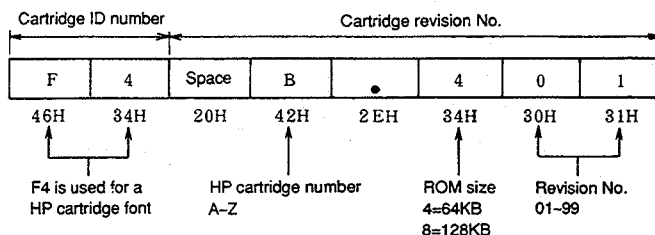


Fig. 9-4-4. Download font configuration

■ Cartridge font information

The cartridge font information is contained from the address FF00 hex.



Those must be ASCII code assigned by a hexadecimal number.

Sumcheck data

- For the 64KB cartridge
Data between 0000H and FFFE H added in terms of byte is stored in FFFFH.
- For the 128KB cartridge
Data between 0000H and 1FFFE H added in terms of byte is stored in 1FFFFH.

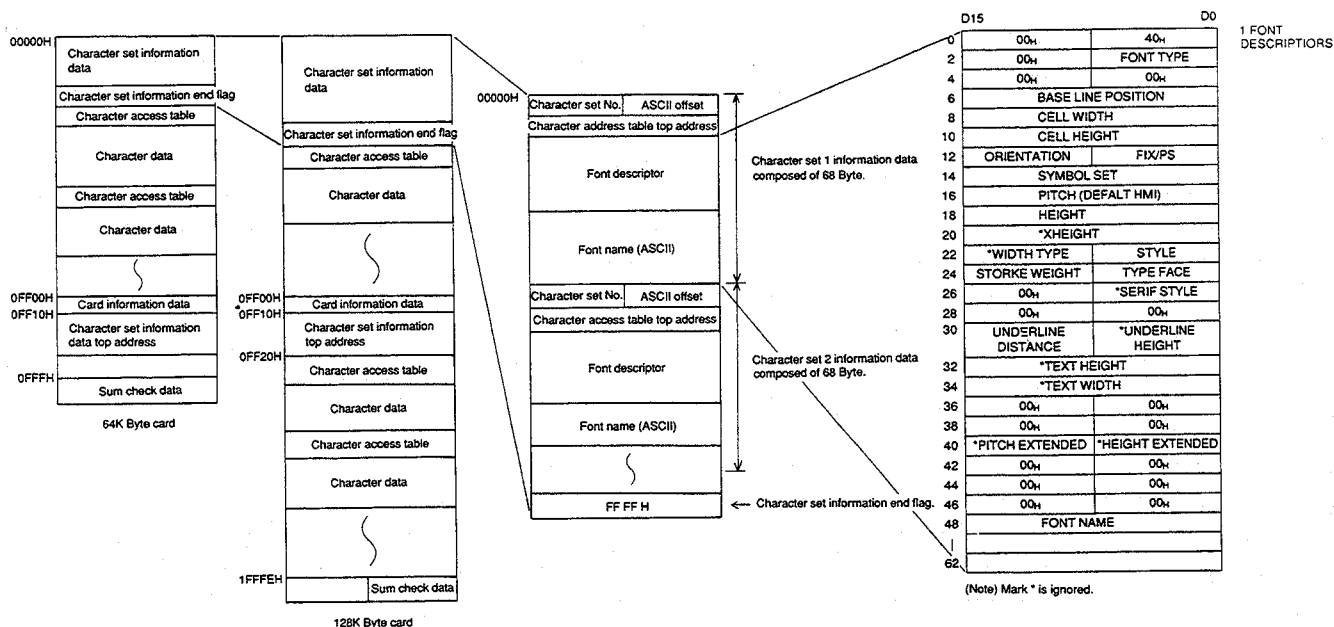
The block structure of a 128KB cartridge is same as the 64KB cartridge.

9-4-4. Cartridge font configuration

■ Kinds (for emulation only)

- Hewlett Packard LaserJet Series II
- Diablo 630
- Diablo 630 ECS

Two kinds are available; 64KB or 128KB.
The following shows the configuration.



9-4-5. List of FONT ID

ID	HPSR2	FX-80	IBMPP	IBMGP	D630	HEX
00	COURIER P ROMAN-8	PICA P	PICA P	PICA P	PICA P	COURIER
01	COURIER P PC-8	PICA SCRIPT P	PICA (D/N) P	PICA (D/N) P	PICA L	CONDENSE SCRIPT
02	COURIER P PC-8 (D/N)	CONDENSE P	PICA SCRIPT P	PICA SCRIPT P	INSTALED CARD (USA) P	
03	COURIER P ECMA-94	CONDENSE SCRIPT P	PICA SCRIPT (D/N) P	PICA SCRIPT (D/N) P	(FRANCE) P	
04	COURIER BOLD P ROMAN-8	ELITE P	CONDENSE P	CONDENSE P	(GERMANY) P	
05	COURIER BOLD P PC-8	ELITE SCRIPT P	CONDENSE (D/N) P	CONDENSE (D/N) P	(U.K.) P	
06	COURIER BOLD P PC-8 (D/N)	PICA L	CONDENSE SCRIPT P	CONDENSE SCRIPT P	(DENMARK1) P	
07	COURIER BOLD P ECMA-94	PICA SCRIPT L	C-SCRIPT (D/N) P	C-SCRIPT (D/N) P	(SWEDEN) P	
08	LINE PRINTER P ROMAN-8	CONDENSE L	ELITE P	PICA L	(ITALY) P	
09	LINE PRINTER P PC-8	CONDENSE SCRIPT L	ELITE (D/N) P	PICA (D/N) L	(SPAIN) P	
0A	LINE PRINTER P PC-8 (D/N)	ELITE L	ELITE SCRIPT P	PICA SCRIPT L	(JAPAN) P	
0B	LINE PRINTER P ECMA-94	ELITE SCRIPT L	ELITE SCRIPT (D/N) P	PICA SCRIPT (D/N) L	(NORWAY) P	
0C	COURIER L ROMAN-8		PICA L	CONDENSE L	(DENMARK2) P	
0D	COURIER L PC-8		PICA (D/N) L	CONDENSE (D/N) L	INSTALED CARD (USA) L	
0E	COURIER L PC-8 (D/N)		PICA SCRIp L	CONDENSE SCRIPT L	(FRANCE) L	
0F	COURIER L ECMA-94		PICA SCRIPT (D/N) L	C-SCRIPT (D/N) L	(GERMANY) L	
10	COURIER BOLD L ROMAN-8		CONDENSE L		(U.K.) L	
11	COURIER BOLD L PC-8		CONDENSE (D/N) L		(DENMARK1) L	
12	COURIER BOLD L PC-8 (D/N)		CONDENSE SCRIPT L		(SWEDEN) L	
13	COURIER BOLD L ECMA-94		C-SCRIPT (D/N) L		(ITALY) L	
14	*LINE PRINTER L ROMAN-8				(SPAIN) L	
15	*LINE PRINTER L PC-8				(JAPAN) L	
16	*LINE PRINTER L PC-8 (D/N)				(NORWAY) L	
17	*LINE PRINTER L ECMA-94				(DENMARK2) L	
18	CARD A					
19						
49						
4A						
4B	CARD B					
4C						
7C						
7D						
7E						
7F						
80	DOWN LOAD FONT					
81						
82						
9E						
9F						
A0						
A1	ADV. PATTERN #1 P					
A2	ADV. PATTERN #2 P					
A3	ADV. PATTERN #3 P					
A4	ADV. PATTERN #4 P					
A5	ADV. PATTERN #5 P					
A6	ADV. PATTERN #6 P					
A7	ADV. GRAYSCALE 1-2% P					
A8	ADV. GRAYSCALE 3-10% P					
A9	ADV. GRAYSCALE 11-20% P					
AA	ADV. GRAYSCALE 21-35% P					
AB	ADV. GRAYSCALE 36-55% P					
AC	ADV. GRAYSCALE 56-80% P					

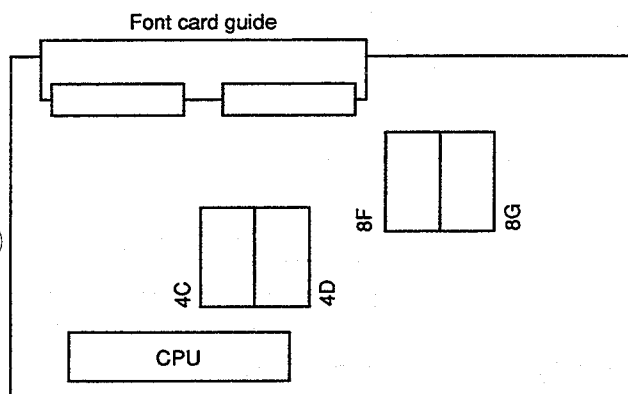
D	HPSR2	FX-80	IBMPP	IBMGP	D630	HEX
AD	ADV. GRAYSCALE 81-99% P					
AE	ADV. GRAYSCALE 100% P					
AF						
B0						
B1						
B2						
B3						
B4						
B5						
B6						
B7						
B8						
B9						
BA						
BB						
BC						
BD						
BE						
BF						

Note: PICA and COURIER in the above table are treated as the same font in the JX-9500.

10. ROM installing positions on ICU PWB

Note: A pair of either CG ROM's or program ROM's is composed of two parts of the same version. Never mix different versions.

ICU PWB



PARTS CODE	LOCATION	VERSION NO.	DESCRIPTION
	8G	ICG1	CG ROM
	8F	ICG2	CG ROM
	4D	CPR1	PROGRAM ROM
	4C	CPR2	PROGRAM ROM

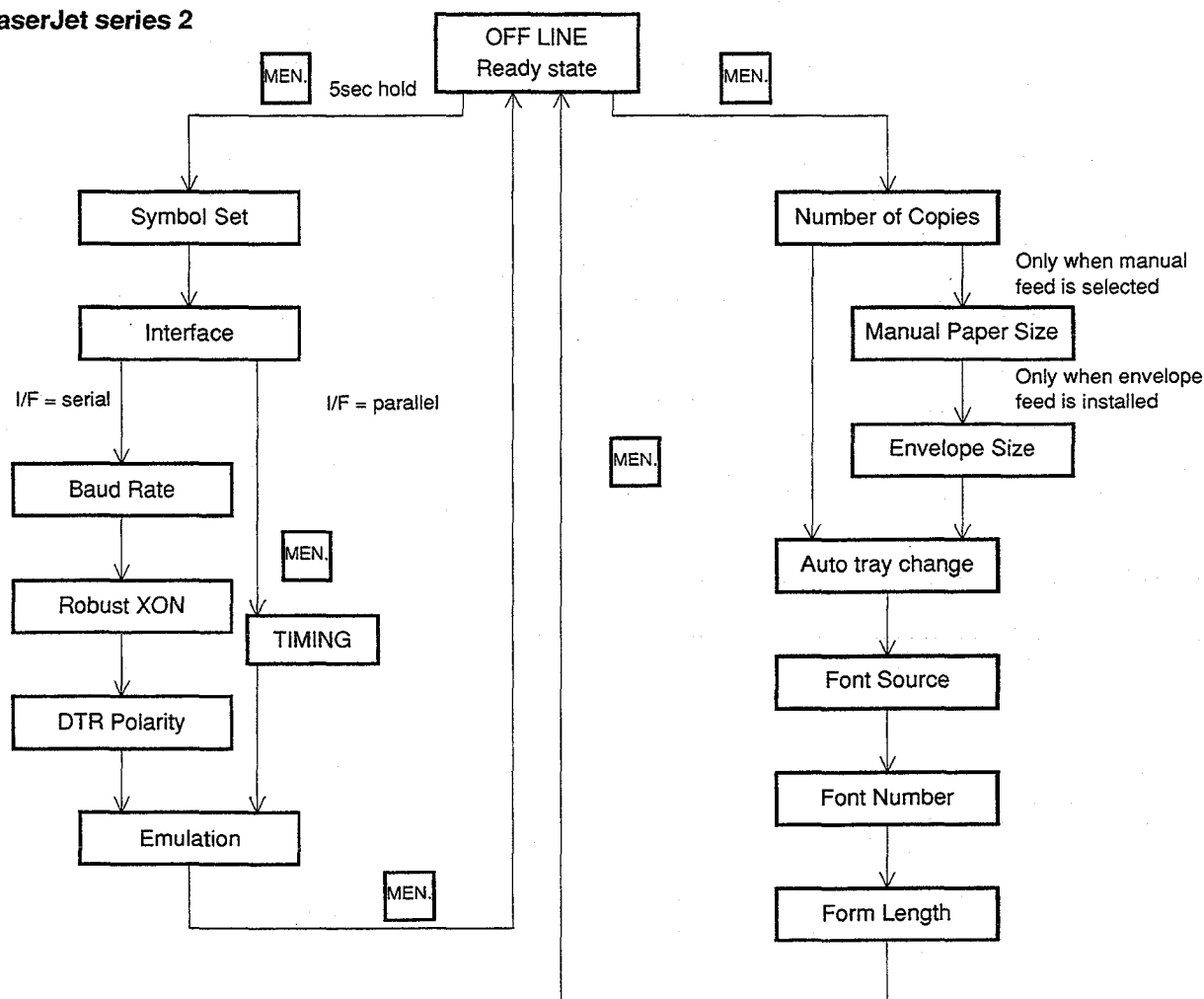
11. MENU SETTING STRUCTURE

11-1. Menu operation

Desired function can be chosen using the MENU key.

Selectable function may vary according to the emulation mode chosen.

i) HP LaserJet series 2



(5sec hold)

Symbol Set #	Display	Symbol Set
8U	Roman-8	
11U	IBM-DN	PC-8 Denmark/Norway
2U	ISO2	ISO IRV
1E	ISO4	ISO United Kingdom
0U	ISO6	ANSI ASCII (USASCII)
3S	ISO10	ISO Swedish
0S	ISO11	ISO Swedish: names
0K	ISO14	JIS ASCII
0I	ISO15	ISO Italian
4S	ISO16	ISO Portuguese
2S	ISO17	ISO Spanish
1G	ISO21	ISO German
10U	IBM-US	PC-8
0N	ECMA-94	ISO 100 Latin 1
0F	ISO25	ISO French
2K	ISO57	ISO Chinese
0D	ISO60	ISO Norwegian v1
1D	ISO61	ISO Norwegian v2
1F	ISO69	ISO French
5S	ISO84	ISO Portuguese: IBM
6S	ISO85	ISO Spanish: IBM
0G	German	HP German
1S	Spanish	HP Spanish

 : Setting item

MEN. : Indicate press menu key

Settings Display

COPIES = 01

MANUAL = LETTER

ENVELOPE = COM-10

AUTO TRAY CHG = Y

FONT NUMBER = 00

(5sec hold)

I/F = SERIAL

BAUD RATE = 9600

ROBUST XON = ON

DTR POLARITY = HI

EMULATION = HPLJ2

Selectable Value

01, 02 ... 99

LETTER, LEGAL, EXECUT, INVOIC, A4, B5

COM-10, MONARC, DL, C5

Y/N

00 ... 50

SERIAL, PARALLEL

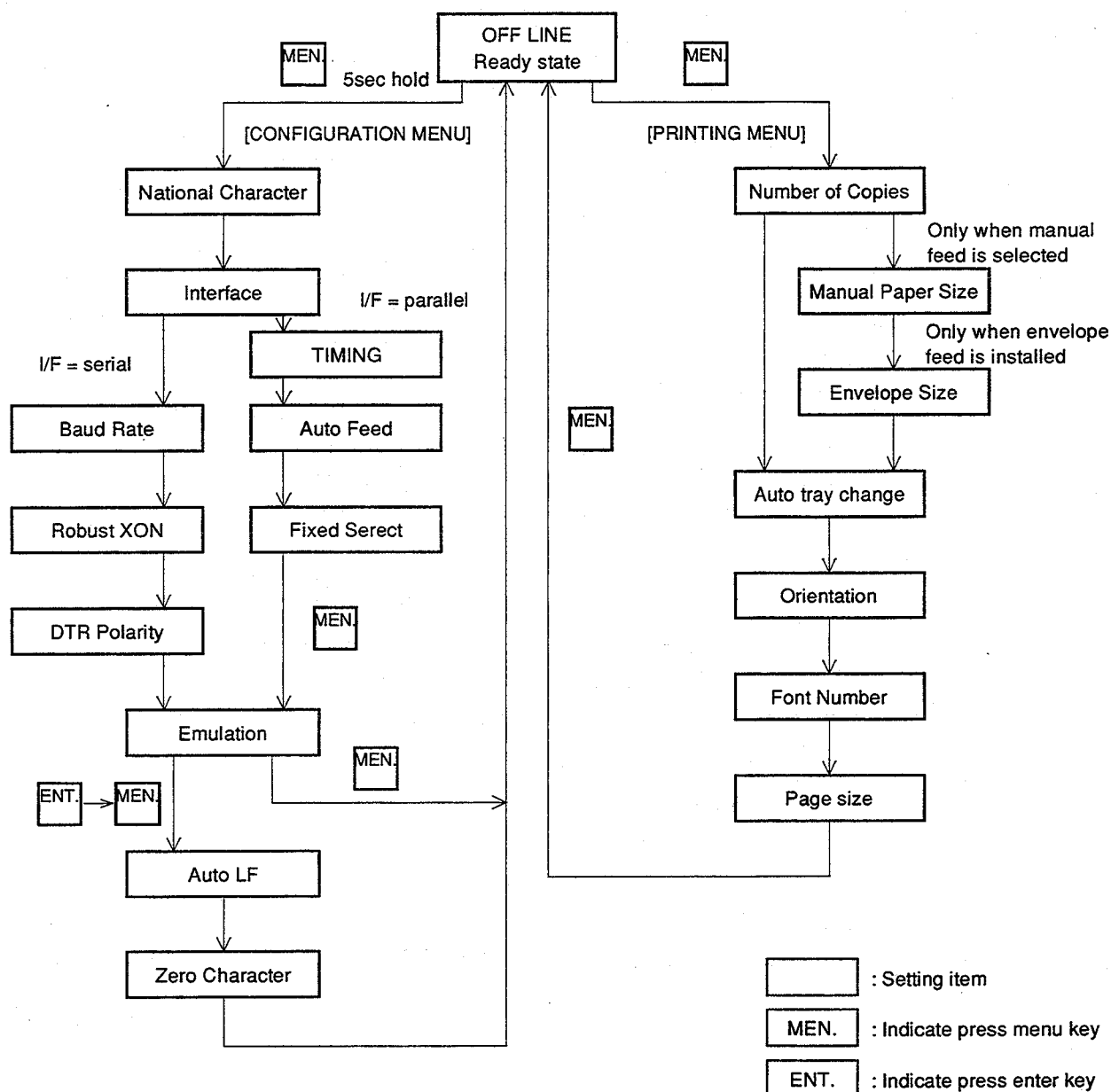
300, 600, 1200, 2400, 4800, 9600, 19200

ON, OFF

HI (High), LO (Low)

HPLJ2, FX80, IBMPP, IBMGP, D630, HEX

ii) FX-80



(5sec hold)

Menu Settings Display
NATIONAL = U.S.A.

Selectable Value

U.S.A., FRANCE, GERMAN, ENGLAND, DNMRK1 SWEDEN, ITALY, SPAIN JAPAN, NORWAY, DNMRK2

I/F = SERIAL

SERIAL, PARALLEL

BAUD RATE = 9600

300, 600, 1200, 2400, 4800, 9600, 19200

ROBUST XON = ON

ON, OFF

DTR POLARITY = HI

HI (High), LO (Low)

TIMING = 1

1, 2

AUTO FEED = OFF

OFF, ON

FIX SELECT = ON

OFF, ON

EMULATION = FX80

HPLJ2, FX80, IBMPP, IBMGP, D630, HEX

AUTO LF = OFF

OFF (CR = CR)
ON (CR = CR + LF)

ZERO = "0"

"0", "Ø"

Settings Display

COPIES = 01

Selectable Value

01, 02 ... 99

MANUAL = LETTER

LETTER, LEGAL, EXECUT, INVOIC, A4, B5

ENVELOPE = COM-10

COM-10, MONARC, DL, C5

AUTO TRAY CHG = Y

Y/N

ORIENTATION = P

P (Portrait)
L (Landscape)

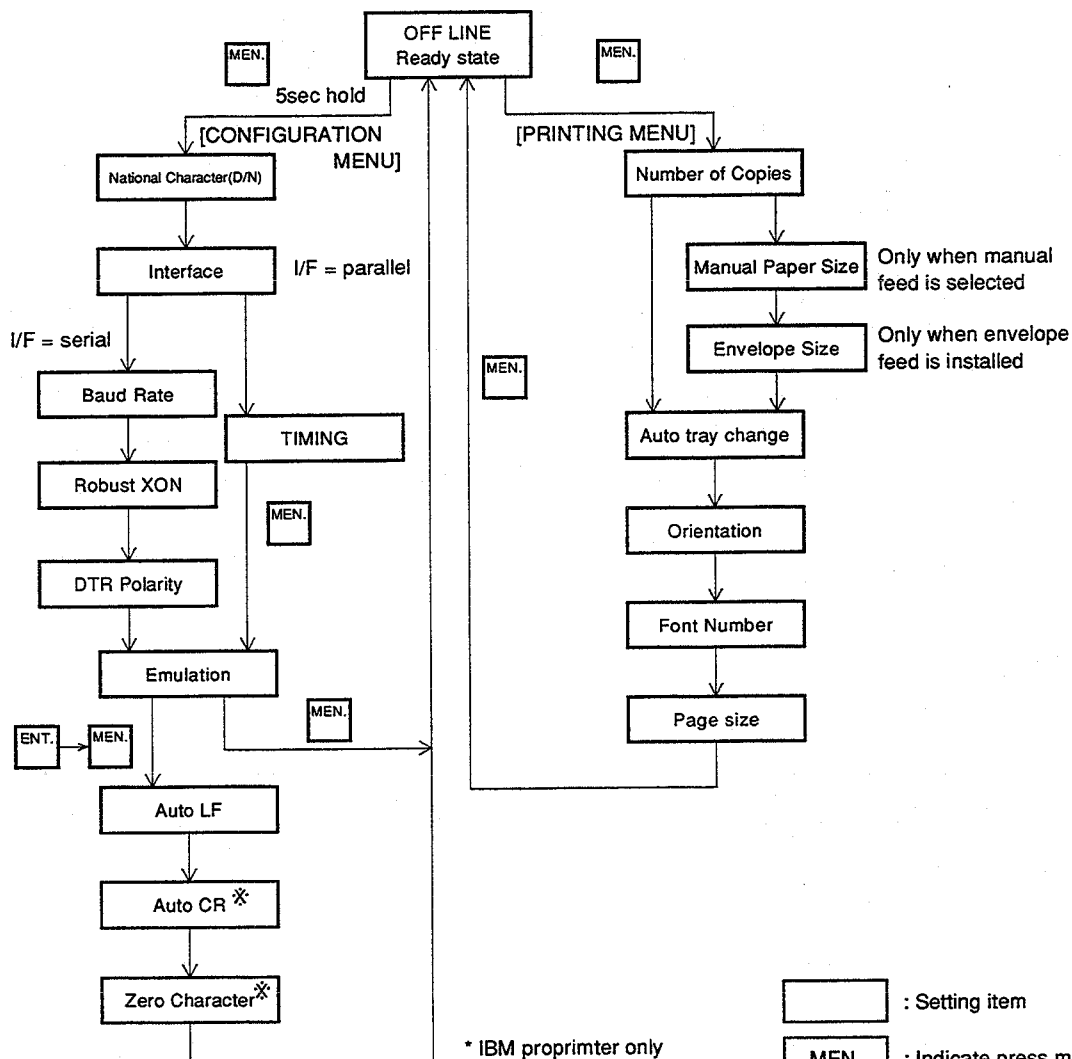
FONT NUMBER = 00

00 ... 50

PG SIZE = NORMAL

NORMAL/EXTEND

iii) IBM Proprinter Graphics Printer



Setting item

MEN. : Indicate press menu key

ENT. : Indicate press enter key

(5sec hold)

Manu Settings
Printer Display

NATIONAL = GLOBAL

I/F = SERIAL

BAUD RATE = 9600

ROBUST XON = ON

DTR POLARITY = HI

TIMING = 1

EMULATION = IBMPP

AUTO LF = OFF

AUTO CR = OFF

ZERO = "0"

Selectable Value

GLOBAL (International)

N (Norway)

D (Denmark)

SERIAL, PARALLEL

300, 600, 1200, 2400, 4800, 9600, 19200

ON, OFF

HI (High), LO (Low)

1, 2

HPLJ2, FX80, IBMPP, IBMGP, D630, HEX

OFF (CR = CR)

ON (CR = CR + LF)

OFF (LF = LF)

ON (LF = LF + CR)

"0", "ø"

Settings Display

COPIES = 01

MANUAL = LETTER

ENVELOPE = COM-10

AUTO TRAY CHG = Y

ORIENTATION = P

FONT NUMBER = 00

PG SIZE = NORMAL

Selectable Value

01, 02... 99

LETTER, LEGAL, EXECUT, INVOIC, A4, B5

COM-10, MONARC, DL, C5

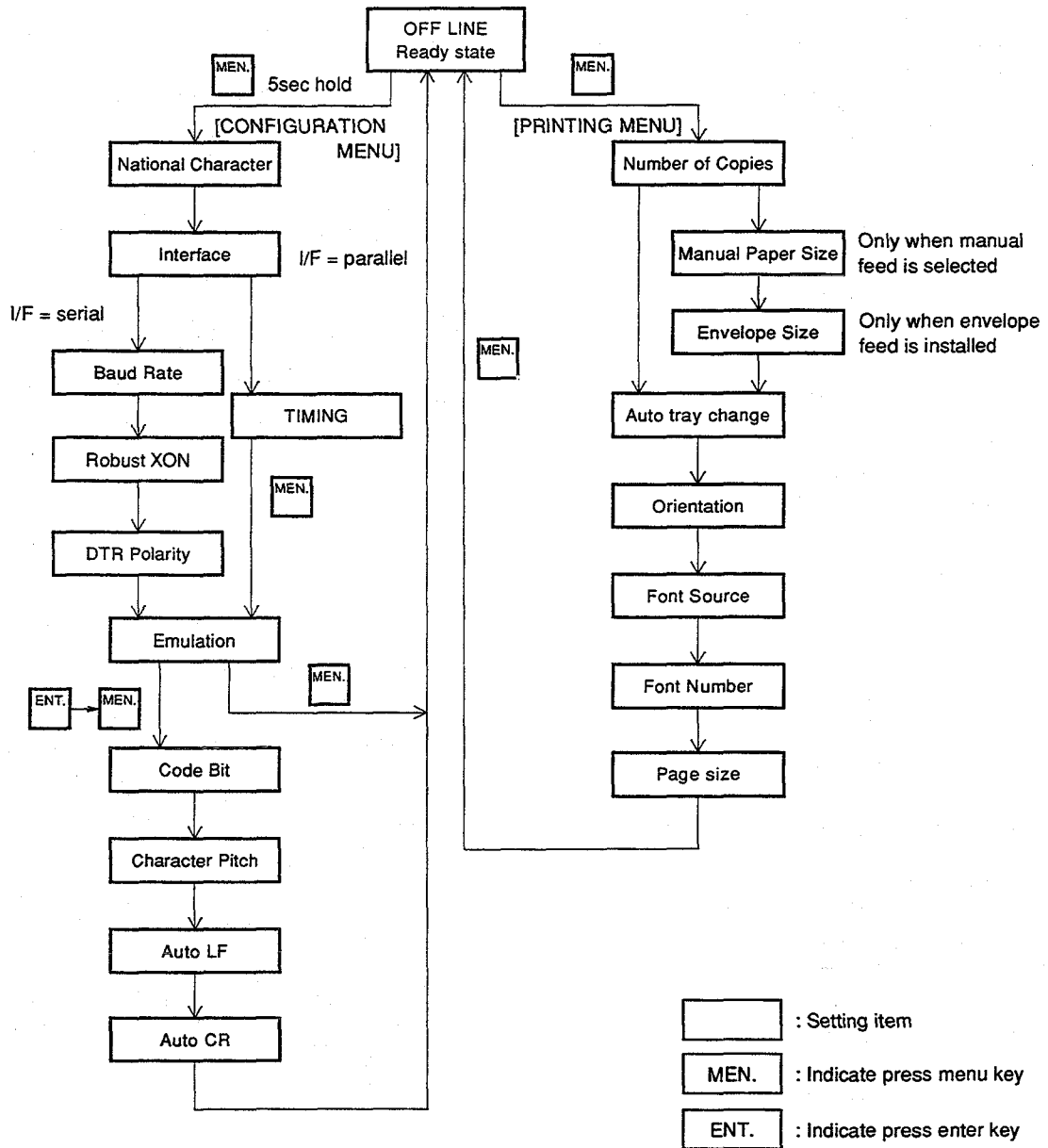
Y/N

P (Portrait)
L (Landscape)

00... 50

NORMAL/EXTEND

iv) Diablo 630/ECS



(5sec hold)

Menu Settings
Printer Display

NATIONAL = U.S.A.

I/F SERIAL

BAUD RATE = 9600

ROBUST XON = ON

TIMING = 1

DTR POLARITY = HI

EMULATION = D630

CODE BIT = 7

CHR.PITCH = 10

AUTO LF = OFF

AUTO CR = OFF

Selectable Value

U.S.A., FRANCE
GERMAN, ENGLAND, DNMRK1,
SWEDEN, ITALY, SPAIN
JAPAN, NORWAY, DNMRK2

SERIAL, PARALLEL

300, 600, 1200, 2400, 4800, 9600, 19200

ON, OFF

1, 2

HI (High), LO (Low)

HPLJ2, FX80, IBMPP, IBMGP, D630,
HEX

7, 8 (bits)

10 (cpi), 12 (cpi), 15 (cpi), PS (pitch)

OFF, ON

OFF, ON

Settings Printer Display

COPIES = 01

MANUAL = LETTER

ENVELOPE = COM-10

AUTO TRAY CHG = Y

ORIENTATION = P

FONT SOURCE = I

FONT NUMBER = 00

PG SIZE = NORMAL

Selectable Value

01, 02 ... 99

LETTER, LEGAL, EXECUT, INVOIC, A4,
B5

COM-10, MONAC, DL, C5

Y/N

P (Portrait)
L (Landscape)I (Internal front)
A (slotcard)
B (slotcard)

00 ... 50

NORMAL/EXTEND

11-2. SETTING THE MENUS

These have been pre-selected at the factory to the initial settings given below, which will remain until changed.

When the settings have been changed to suit your printing needs, they can be saved as Operation Panel Factory Settings which are used whenever you turn on the printer or reset it.

INITIAL SETTINGS

Common Functions

Orientation	Portrait
Page size	Normal
Envelope size	COM-10
Interface	Parallel
Emulation mode	HP LaserJet series II
Automatic line feed	OFF
Paper feed select	Standard cassette
National character	U.S.A.
IBM national character	Global
Automatic carriage return	OFF
Zero character	0

RS-232C Serial Interface Functions

Baud rate	9600
Robust XON	ON
DTR polarity	Hi

FX-80 Emulation Functions

Font number	Courier
FIX auto line feed	OFF
FIXED select	ON

IBM Proprinter Emulation Functions

Font number	SET 1 (SET 2 SEEG)
-------------	--------------------

IBM Graphics Printer Emulation Functions

Font Number	SET 1 (SET 2 SEEG)
-------------	--------------------

Diablo 630 Emulation Functions

Font source	Resident
Form number	0
Character pitch	10

HP LaserJet Series II Emulation Functions

Font source	Resident
Font number	0
Form length	60 (in letter size)
SYMBOL set	Roman-8

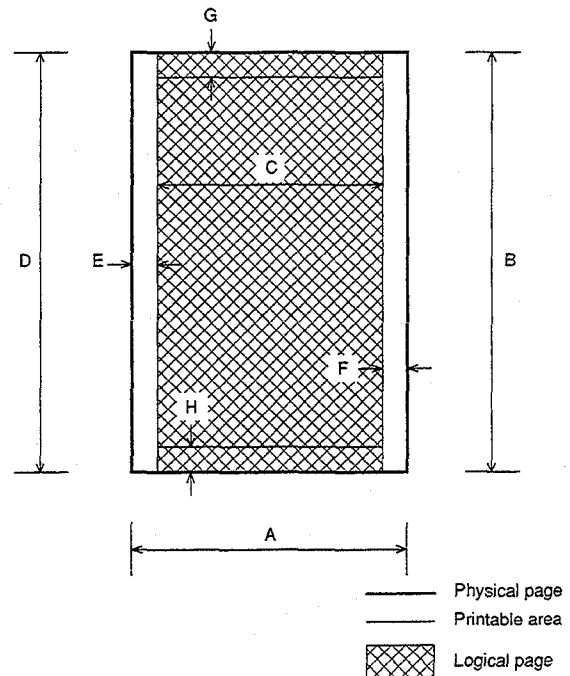
12. Effective print width

The figure at the right shows the effective print width for each paper size in the portrait mode.

For emulations other than HPLJ2, the horizontal effective print width is 2,400 dots for the A4 size. Therefore, you can print 80 characters on a single line if printed by the fixed pitch 10cpi characters. You must note, however, that some part of a character might be missing if a paper skew or paper feed pitch deviation occurs.

IMPORTANT: If the machine is operated with apparent partial characters missing, it may possibly damage the printer.

(Portrait)

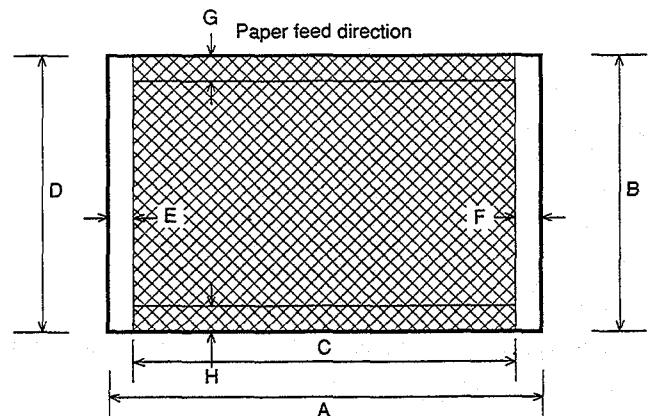


Portrait

PAPER SIZE	A	B	C	D	E	F	G	H
LETTER	2550	3300	2400	3300	50	100	60	60
LEGAL	2550	4200	2400	4200	50	100	60	60
EXECUTIVE	2175	3150	2025	3150	50	100	60	60
INVOICE	1650	2550	1500	2550	50	100	60	60
A4 (HP)	2480	3507	2338	3507	50	92	60	58
A4 (4EML)	2480	3507	2400	3507	50	30	60	58
B5	2149	3035	2007	3035	50	92	60	58
COM-10	1237	2850	1087	2850	50	100	60	60
MONARC	1162	2250	1012	2250	50	100	60	60
C5	1913	2704	1771	2704	50	92	60	58
DL	1299	2598	1157	2598	50	92	60	58

Margin is fixed to A4 (4EML) for the four emulation. (Portrait only)

(Landscape)



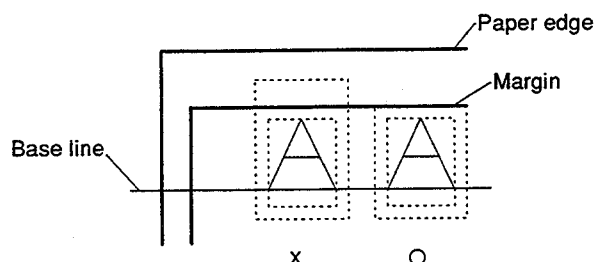
Landscape

PAPER SIZE	A	B	C	D	E	F	G	H
LETTER	3300	2550	3180	2550	60	60	50	100
LEGAL	4200	2550	4080	2550	60	60	50	100
EXECUTIVE	3150	2175	3030	2175	60	60	50	100
INVOICE	2550	1650	2430	1650	60	60	50	100
A4	3507	2480	3389	2480	60	58	50	92
B5	3035	2149	2917	2149	60	58	50	92
COM-10	2850	1237	2730	1237	60	60	50	100
MONARC	2250	1162	2130	1162	60	60	50	100
C5	2704	1913	2586	1913	60	58	50	92
DL	2598	1299	2480	1299	60	58	50	92

13. Print margin

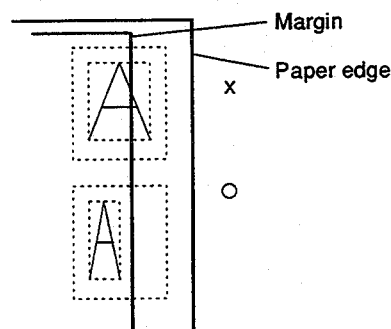
Top

If the value VPOS minus the baseline exceeded the printable area, print would not take place. In other words, the location of the top of the cell determines whether to print or not.



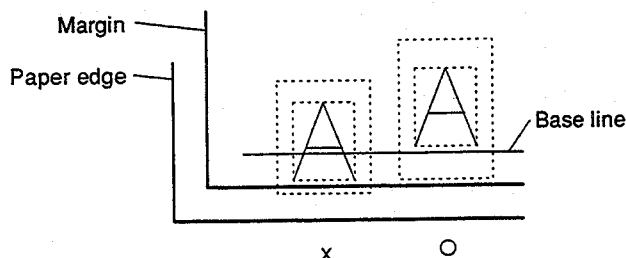
Left

If the value HPOS plus the left offset + character width exceeded the printable area, print would not take place or carried onto a next line depending on a command kind.



Bottom

If the value VPOS plus the cell height minus base position exceeded the printable area, print would not take place or carried onto a next page depending on a command kind.



14. LINES PER PAGE

The lines per page will always default to the number given below when the printer is turned on.

Normal Size

EMULATION	LPI*	ORIENTATION	PORTRAIT						LANDSCAPE					
		PAPER SIZE**	LE	LL	IC	A4	B5	EX	LE	LL	IC	A4	B5	EX
HP LASER JET SERIES II		6 LPI	60	78	45	64	55		45	45	27	43	37	
Epson FX-80		6 LPI	63	81	48	66	57		48	48	30	46	39	
IBM Proprinter		8 LPI	84	108	64	88	76		64	64	39	61	52	
IBM Graphics Printer		9 LPI	94	121	72	99	85		72	72	44	68	59	
Diablo 630		12 LPI	125	161	95	131	113		95	95	59	91	78	

Extended Size

EMULATION	LPI*	ORIENTATION	PORTRAIT						LANDSCAPE					
		PAPER SIZE**	LE	LL	IC	A4	B5	EX	LE	LL	IC	A4	B5	EX
Epson FX-80		6 LPI	66	84	51	70	60		51	51	33	49	42	
IBM Proprinter		8 LPI	88	112	68	93	80		68	68	44	66	56	
IBM Graphics Printer		9 LPI	99	126	76	105	91		76	76	49	74	64	
Diablo 630		12 LPI	132	168	102	140	120		102	102	65	98	84	

This mode can be used with the Epson FX-80, IBM Proprinter, IBM Graphics Printer and Diablo 630 emulations.

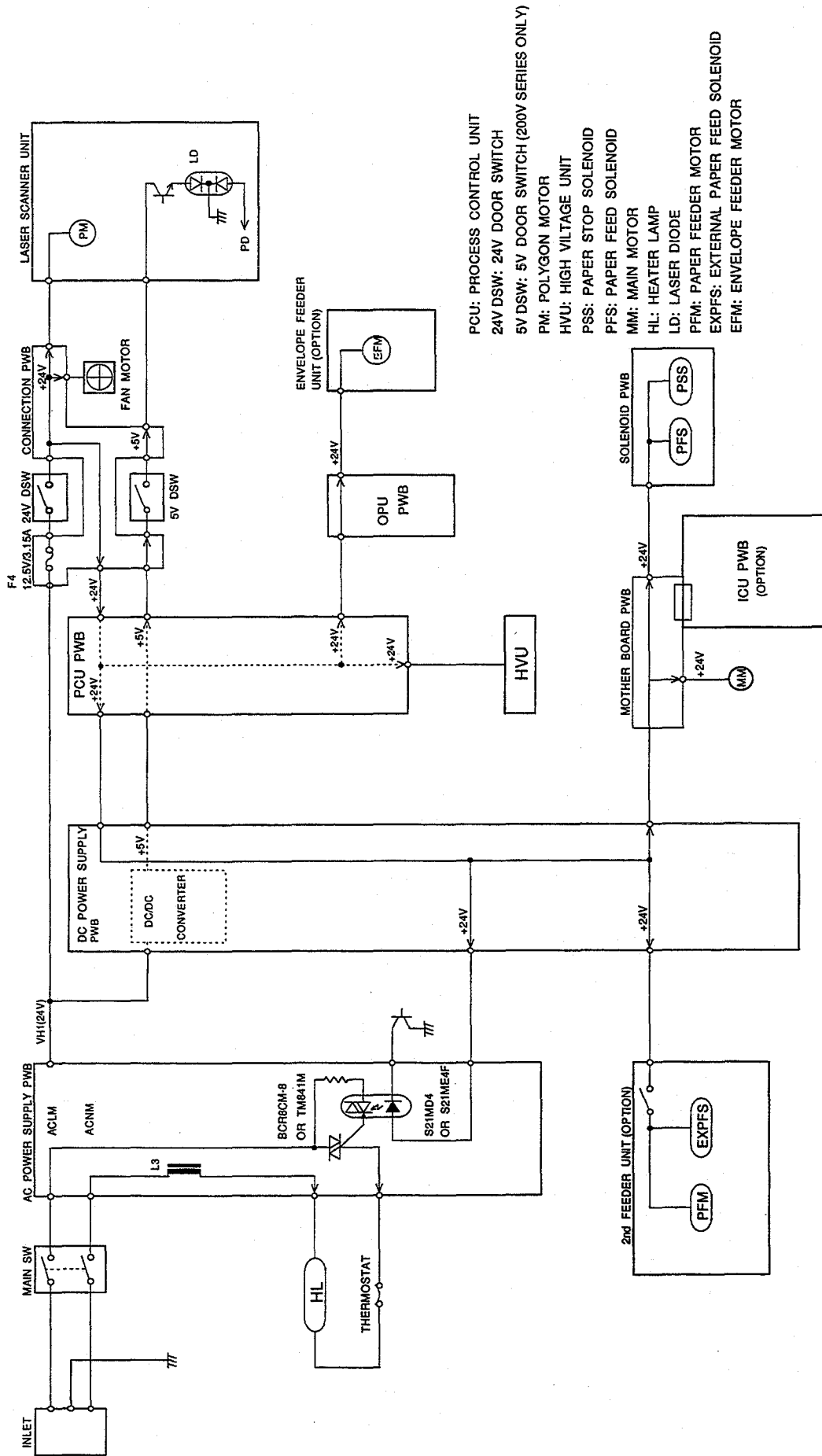
* LPI ... line per inch

* Paper size LE ... Letter
LL ... Legal
IC ... Invoice
EX ... Executive

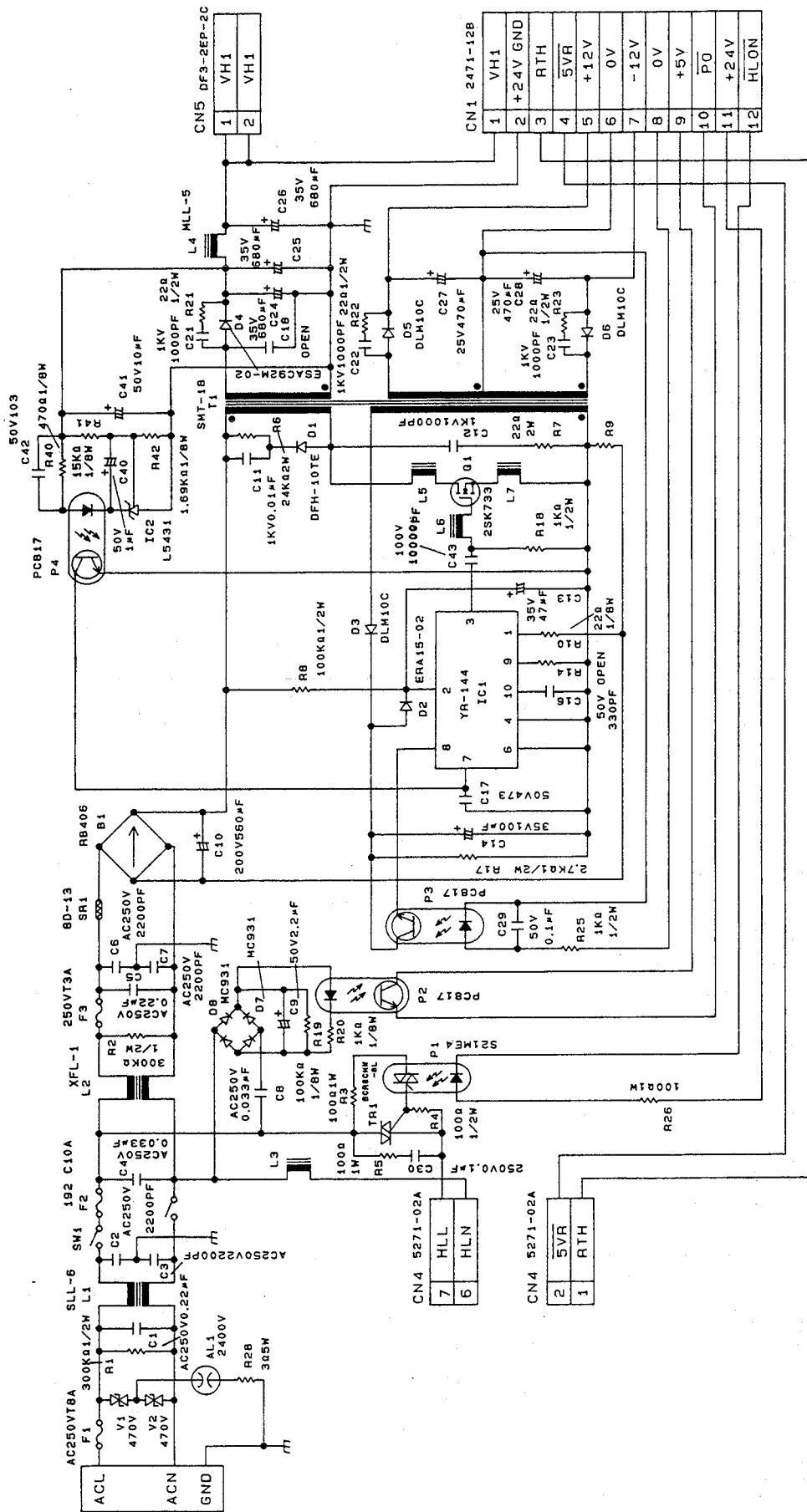
[14] Circuit diagram**CONTENTS**

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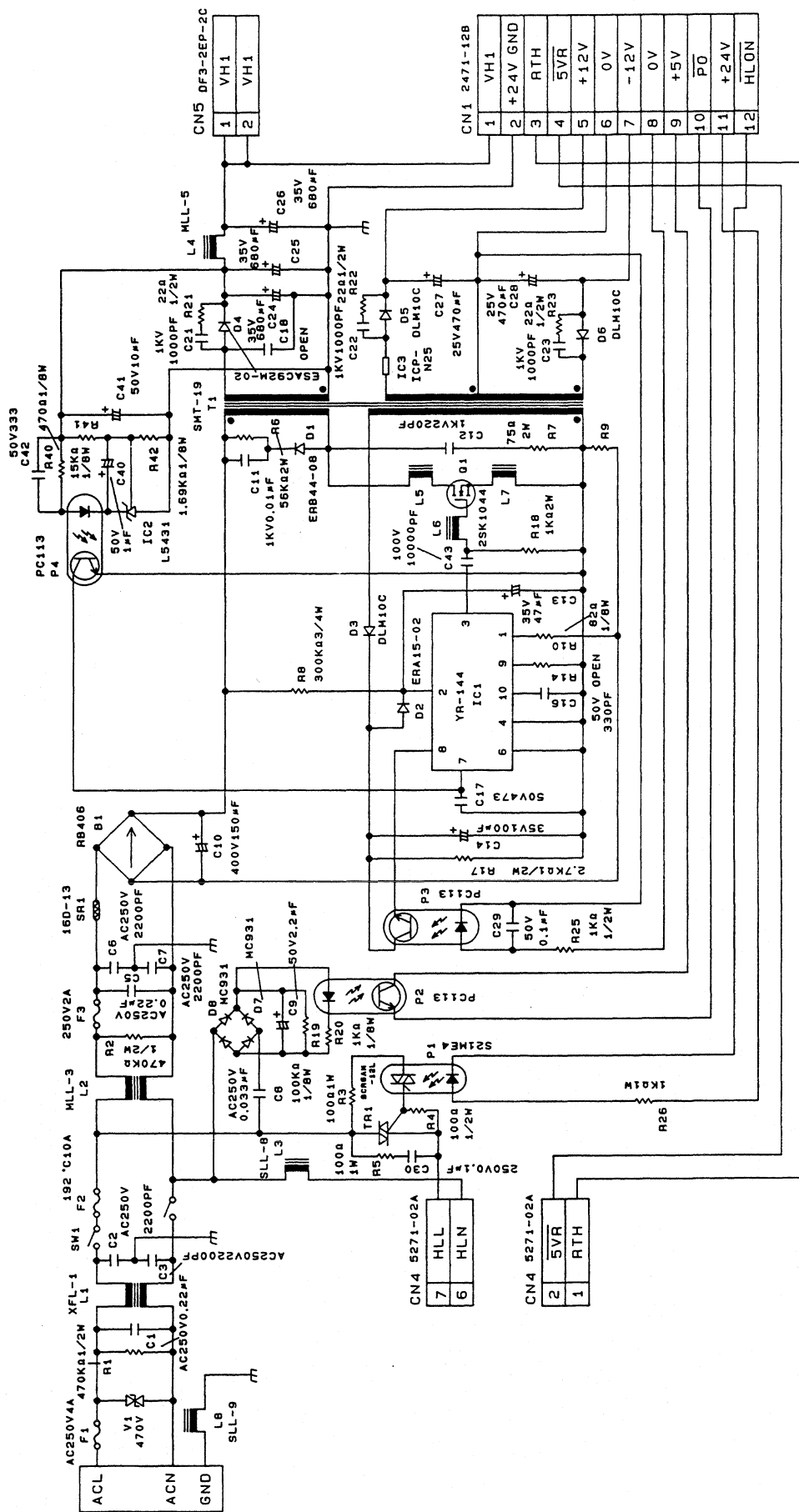
[1] INTERLOCK CIRCUIT



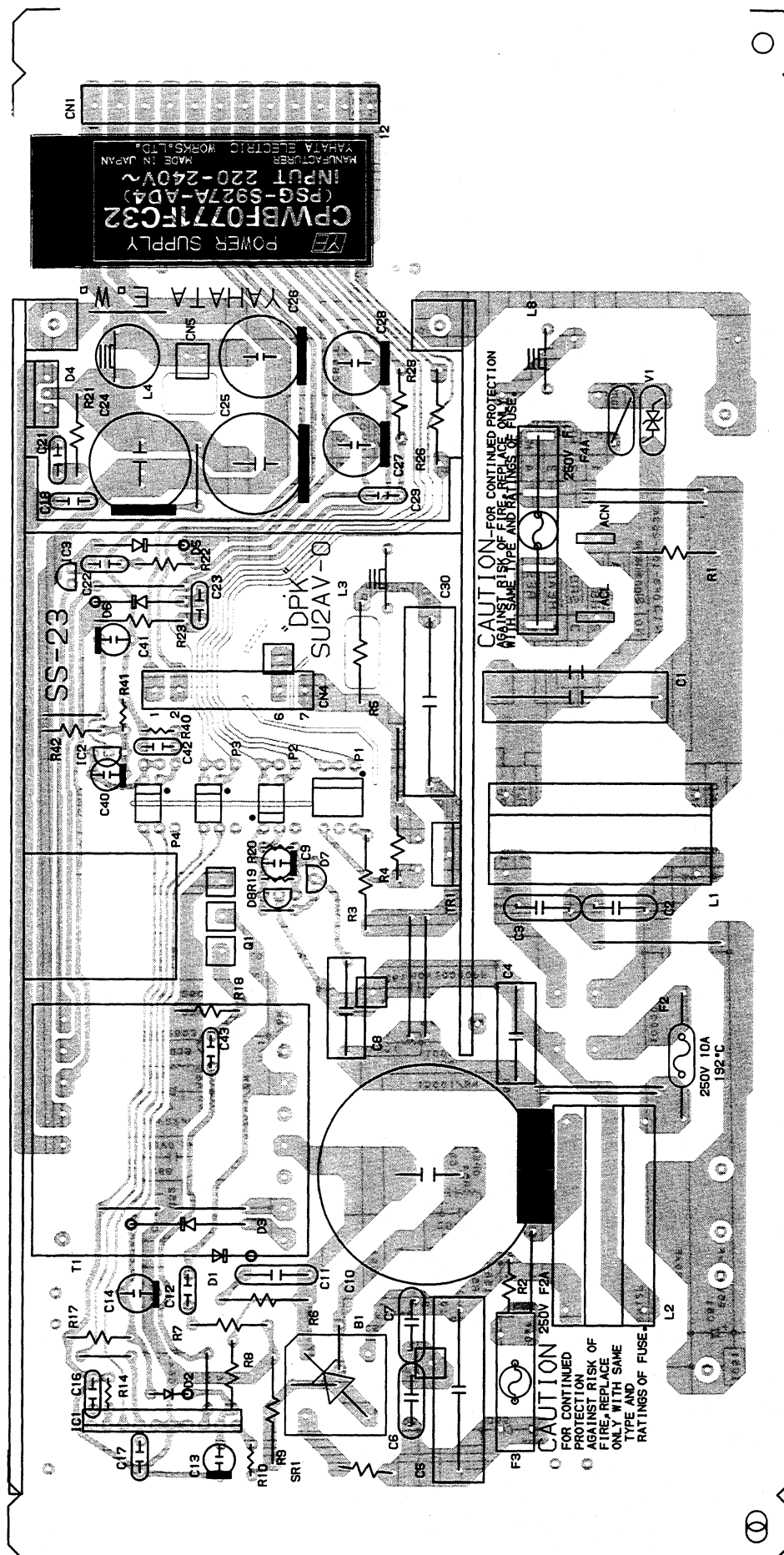
[2].AC/DC1 POWER SUPPLY CIRCUIT (100V SERIES)



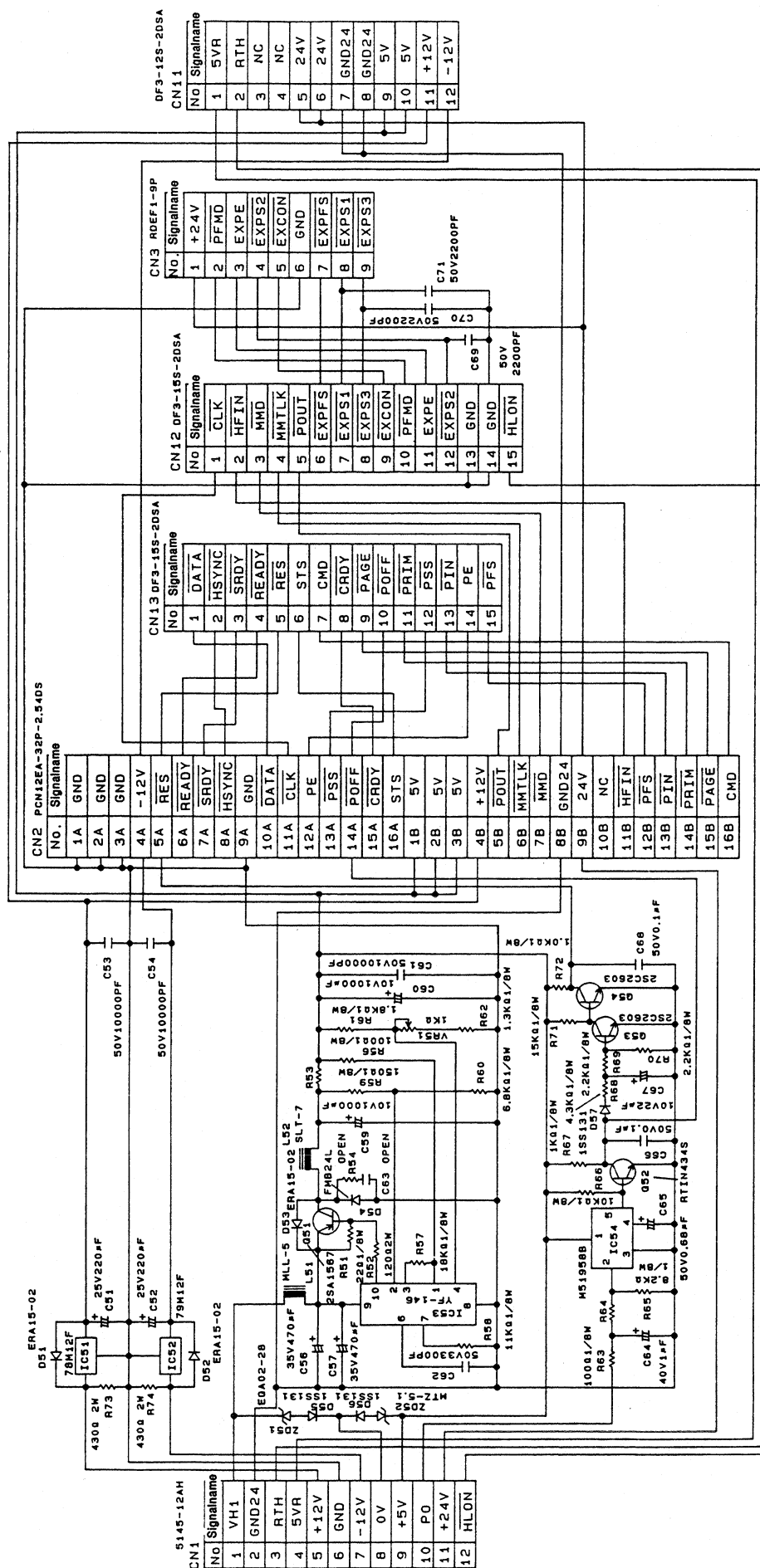
[2] AC/DC1 POWER SUPPLY CIRCUIT (200V SERIES)



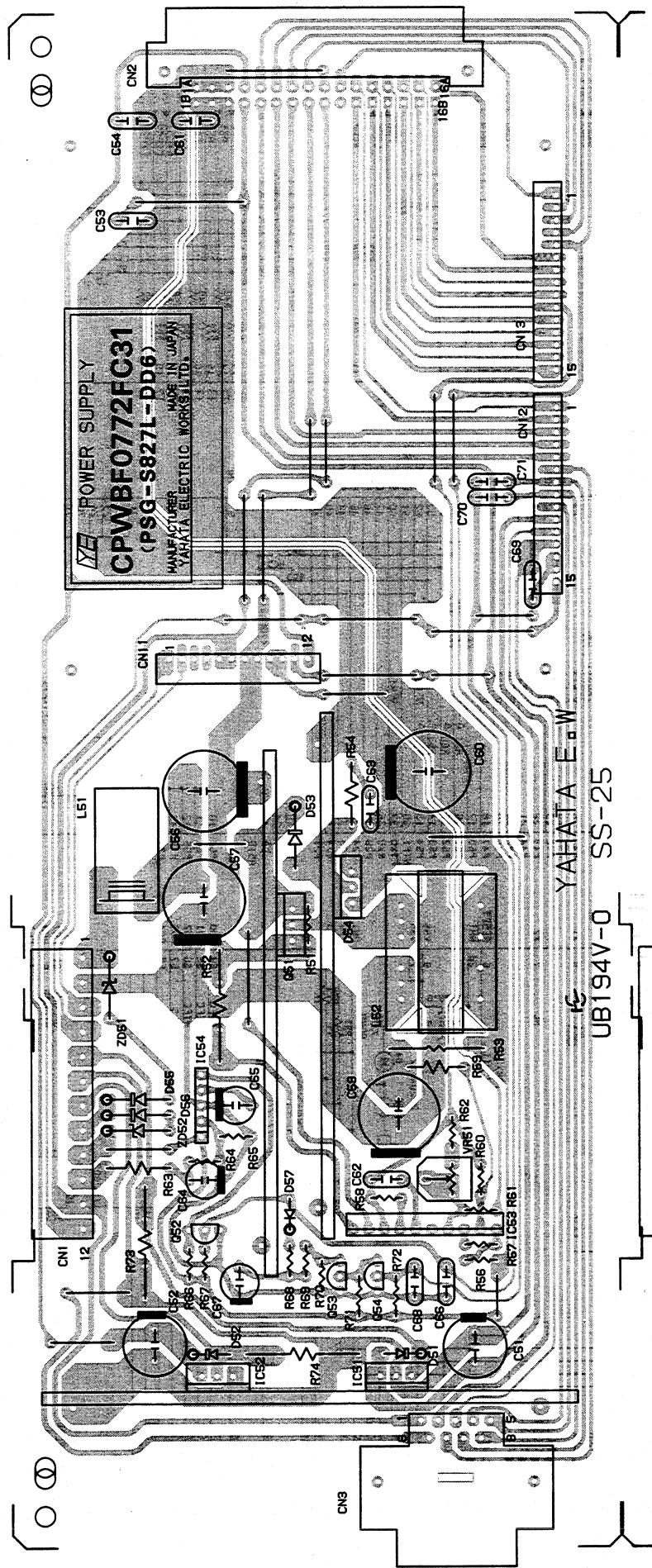
[2] AC/DC1 POWER SUPPLY P.W.B. (200V SERIES)



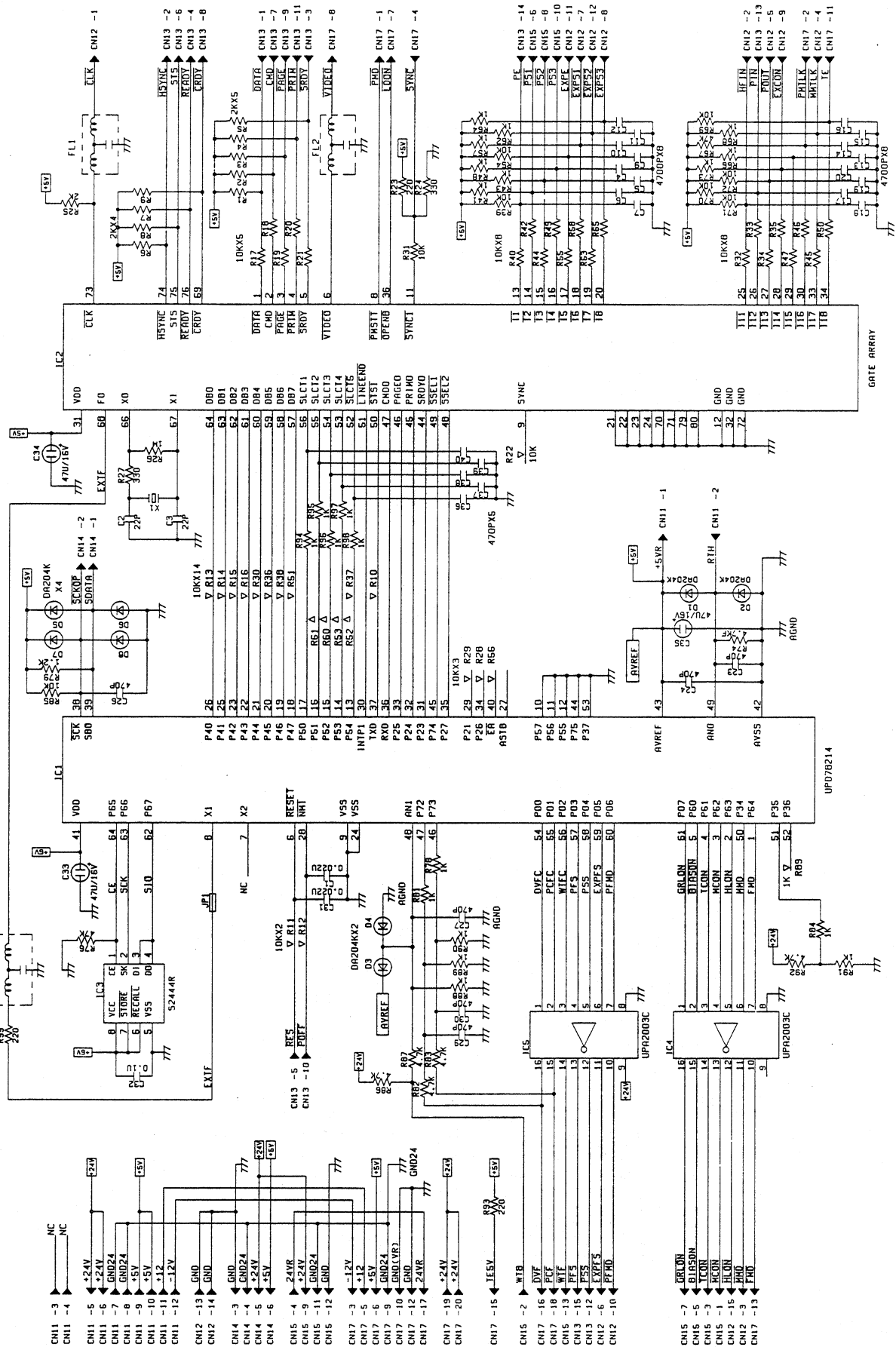
[3] DC2 POWER SUPPLY CIRCUIT



[3] DC2 POWER SUPPLY P.W.B.

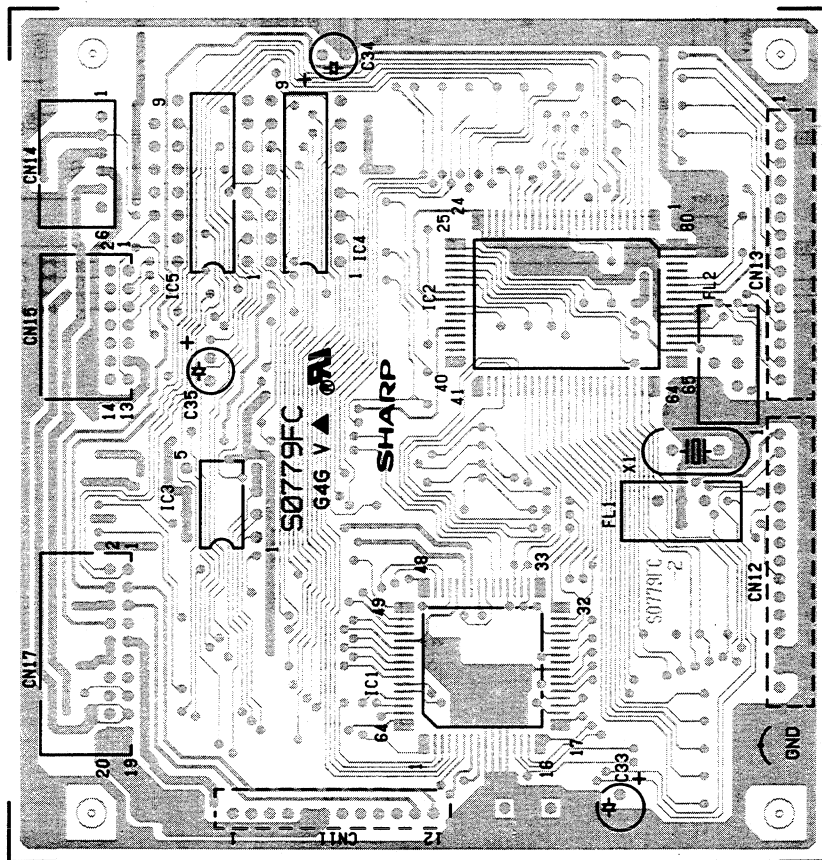


[4] PCU CIRCUIT

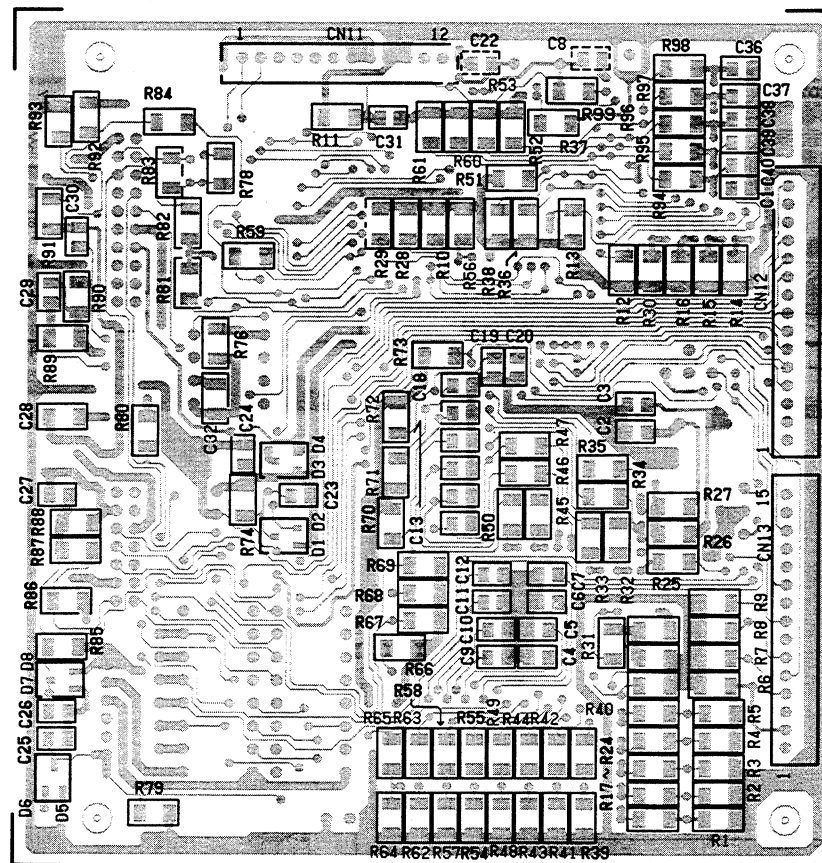


[4] PCU P.W.B.

(Top view)

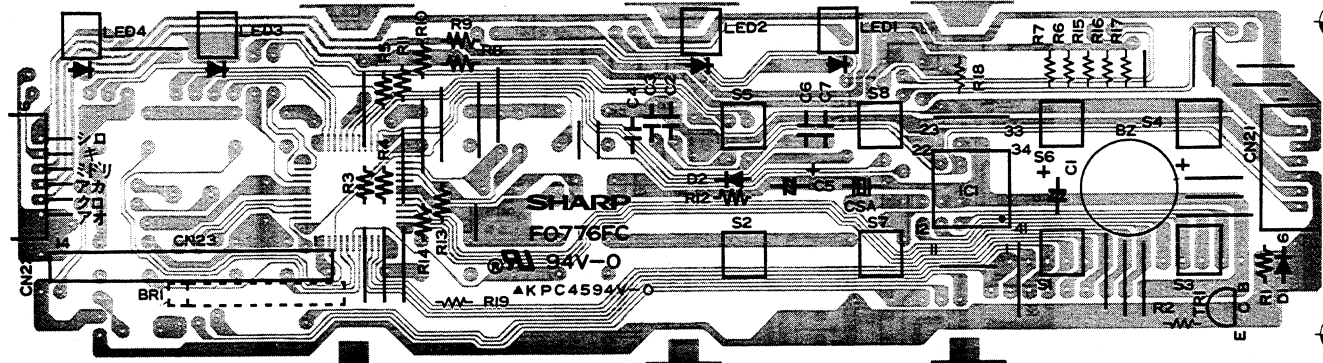
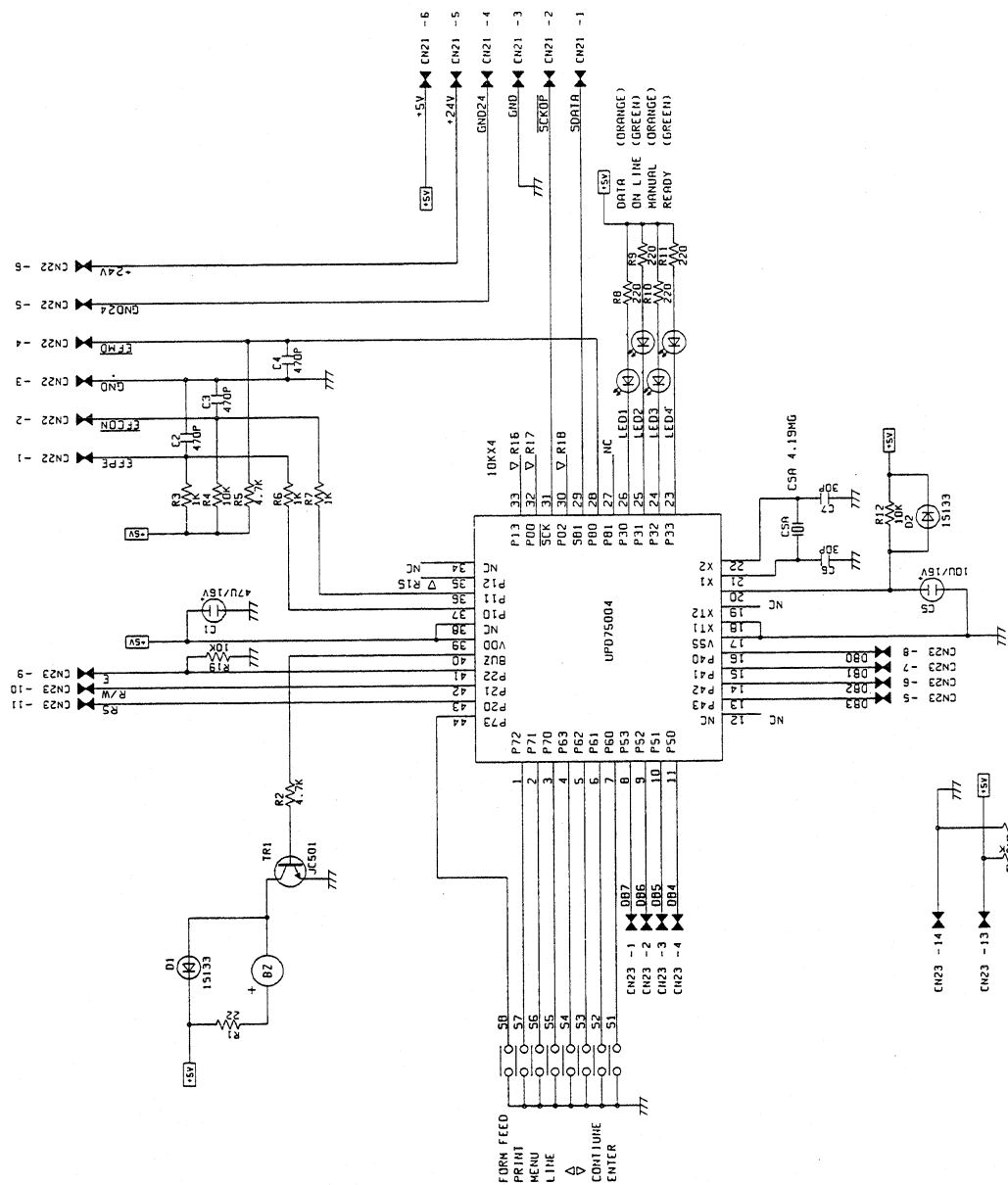


(Bottom view)



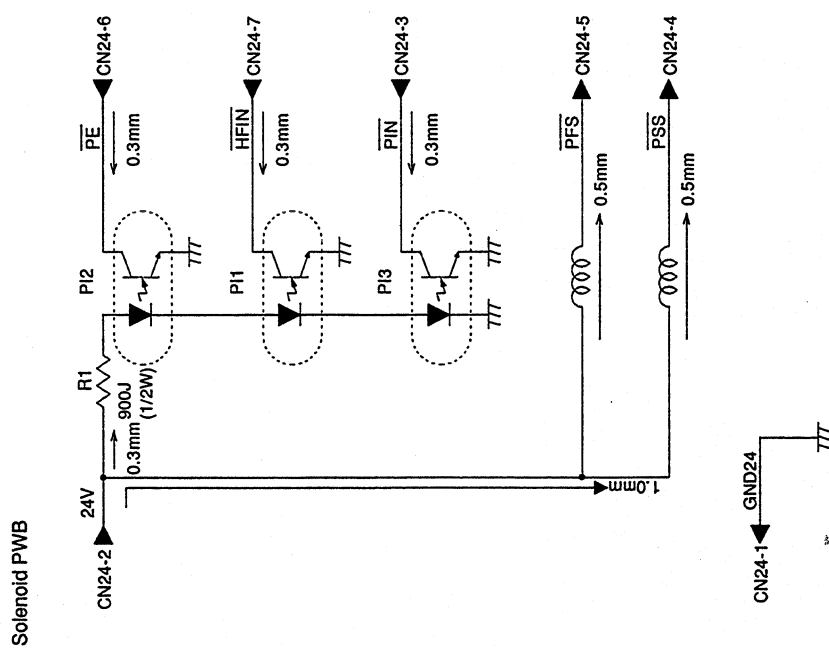
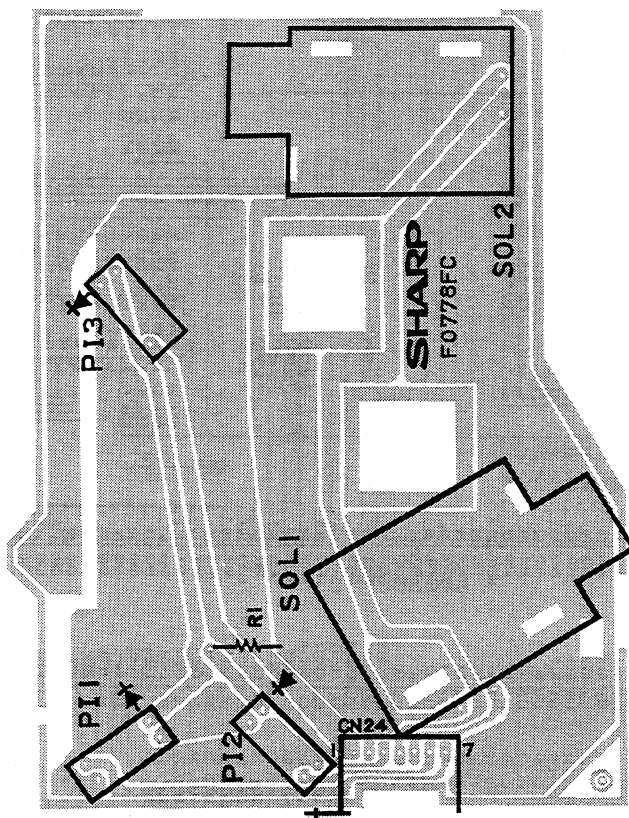
[5] OPERATION CIRCUIT

[5] OPERATION P.W.B.

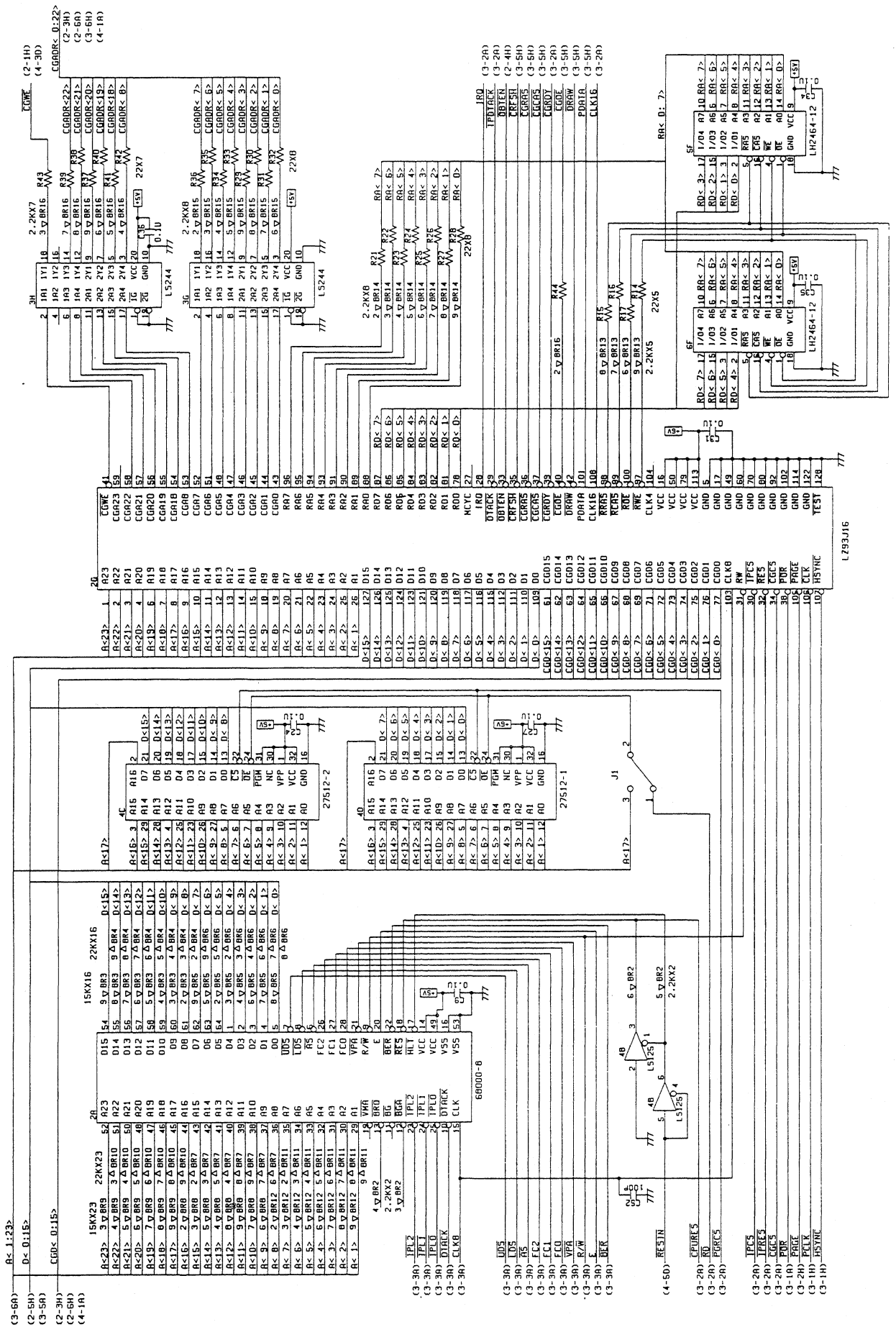


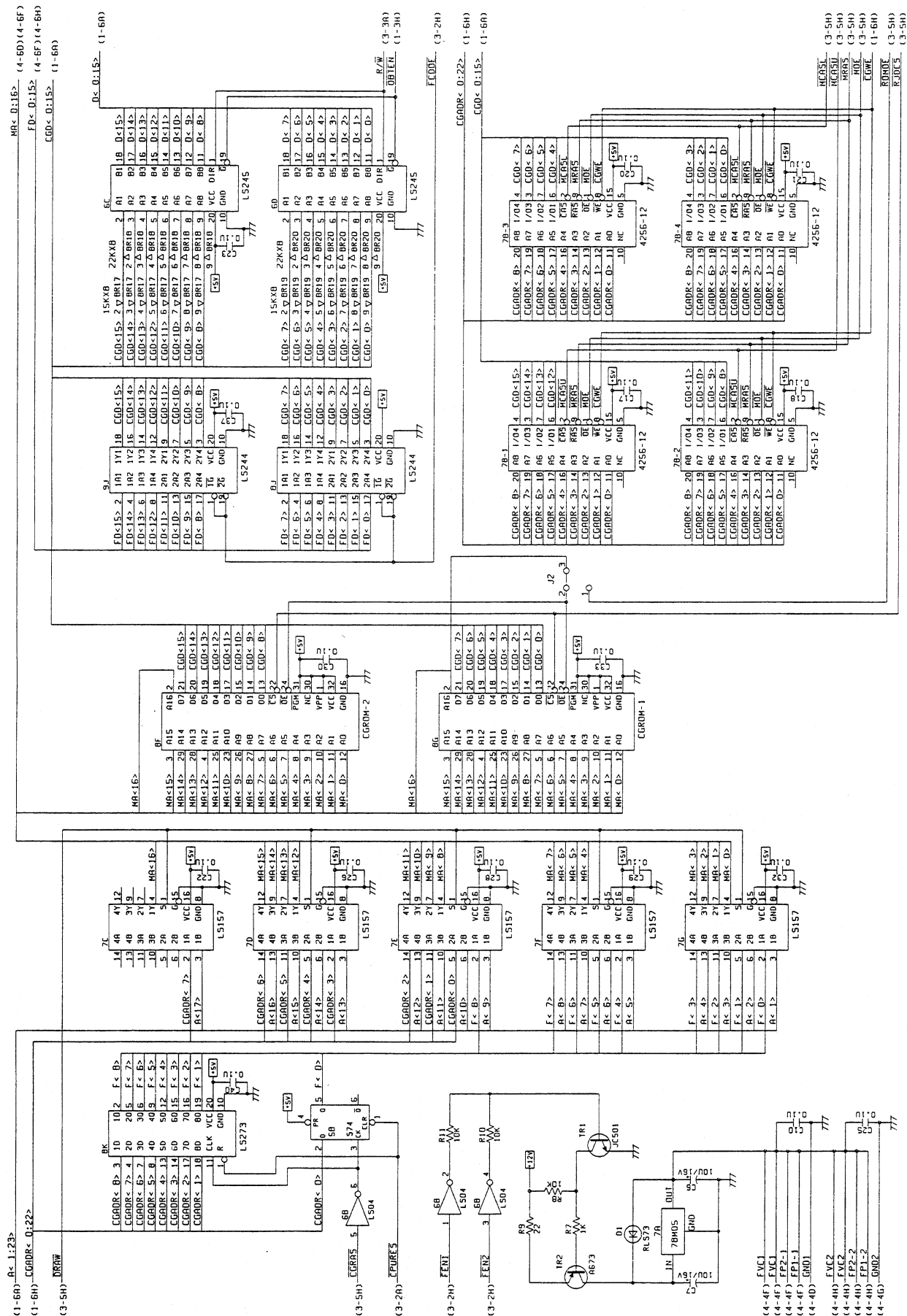
[6] SOLENOID CIRCUIT

[6] SOLENOID P.W.B.

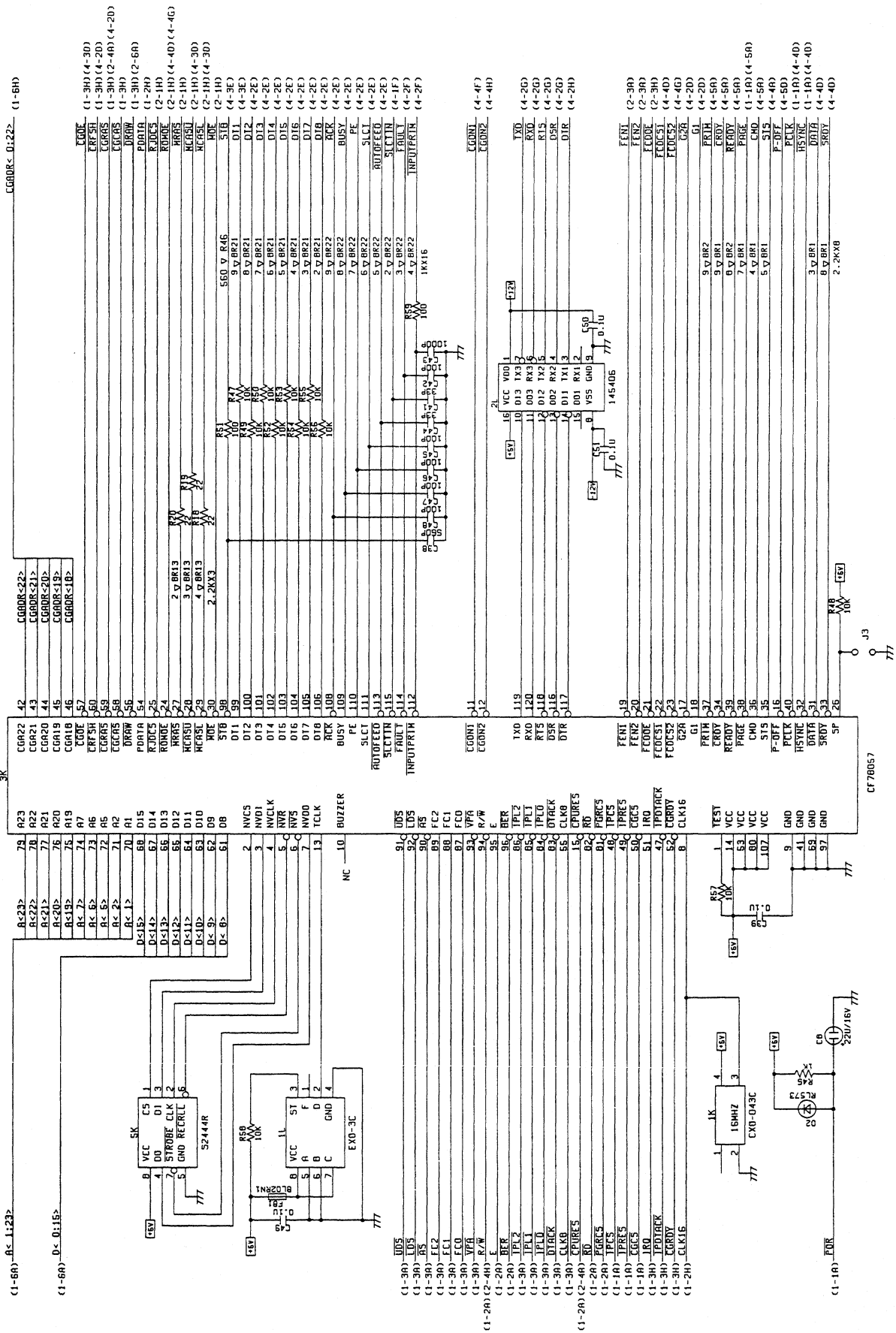


[7] ICU CIRCUIT-1 (CPU, IPL SECTION)

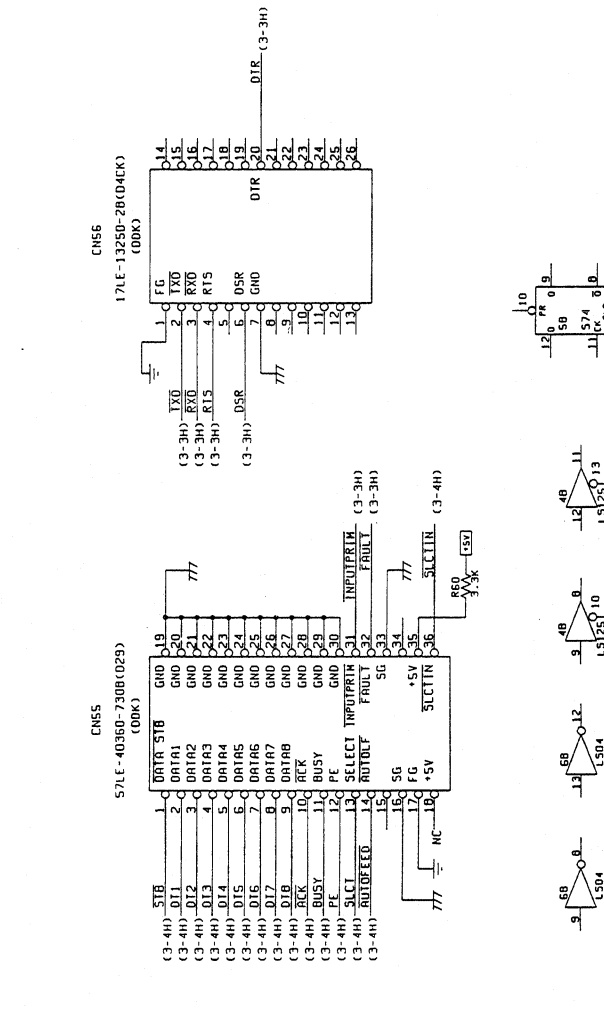
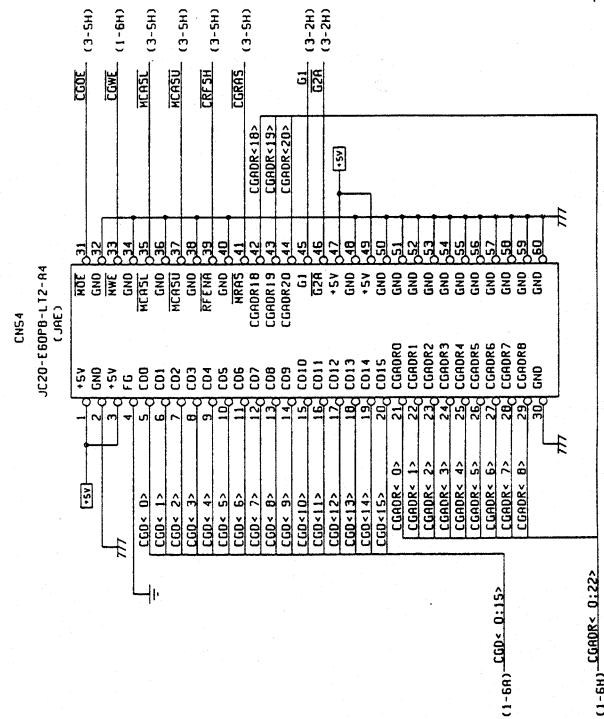
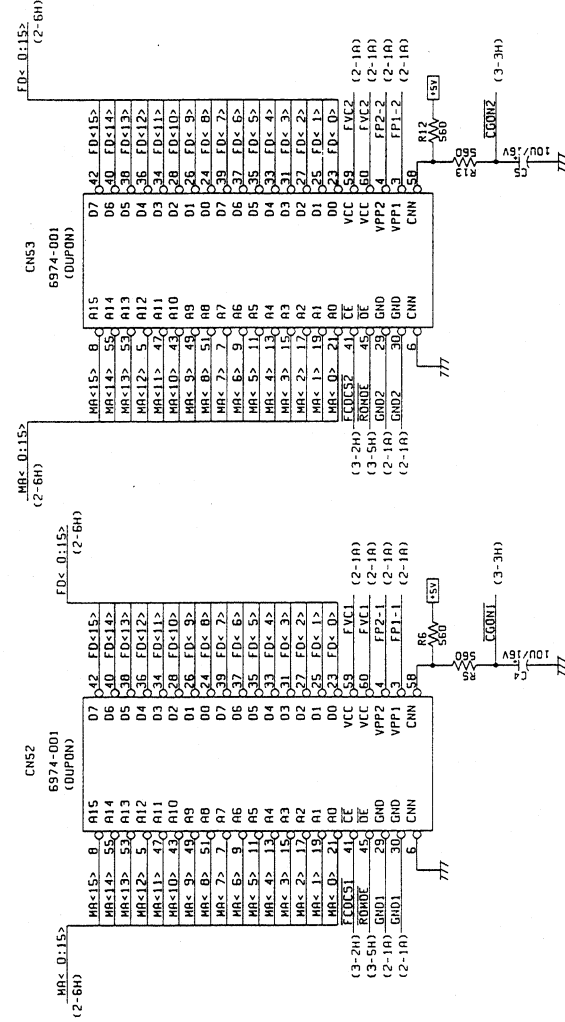
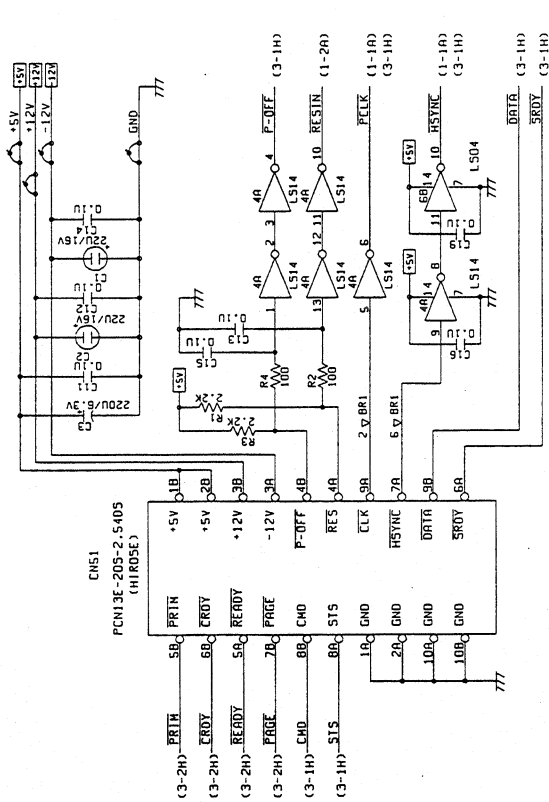




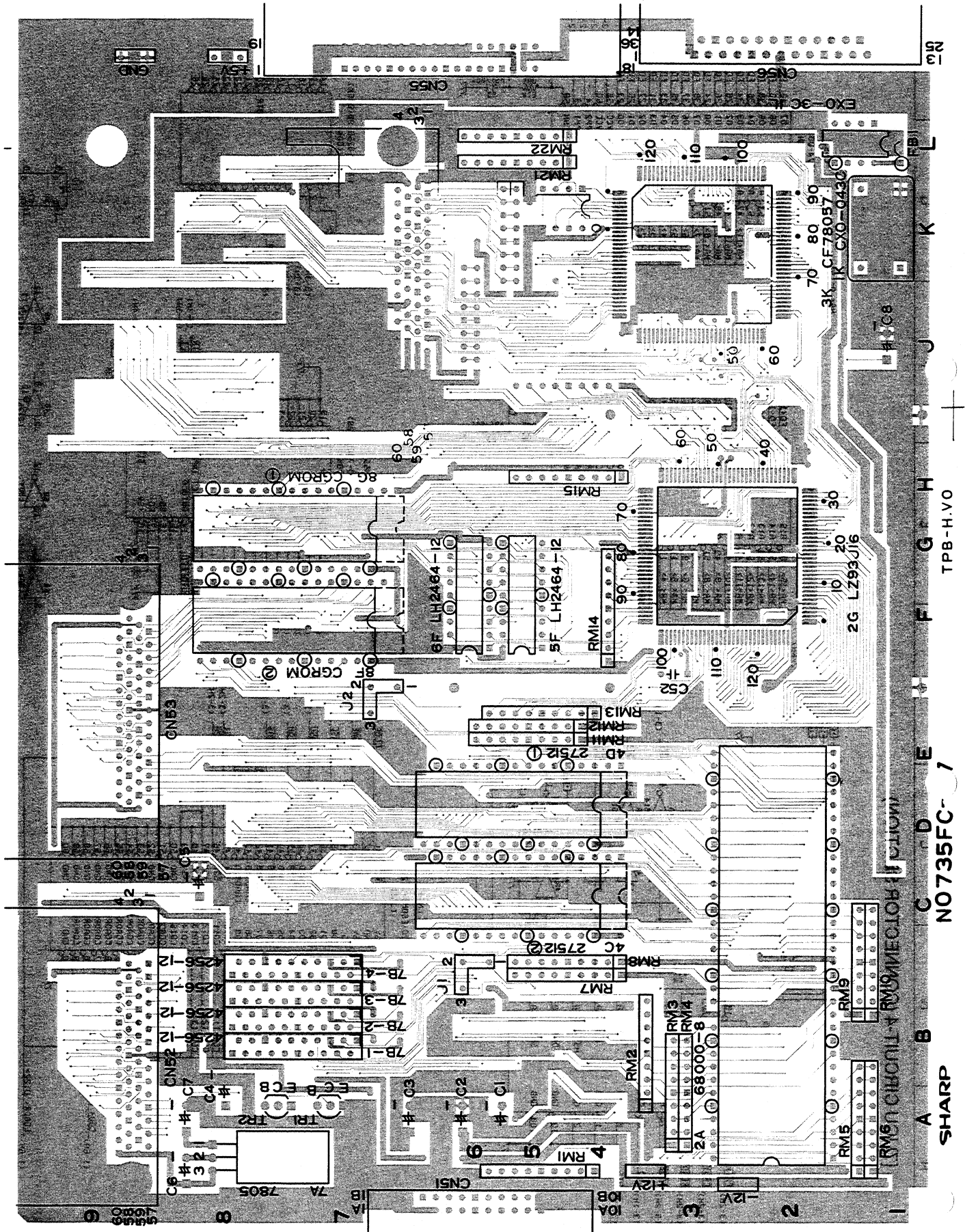
[7] ICU CIRCUIT-3 (I/F LSI SECTION)



[7] ICU CIRCUIT-4 (CONNECTOR SECTION)



[7] ICUP.W.B. (TOP VIEW)



NO735FC-1

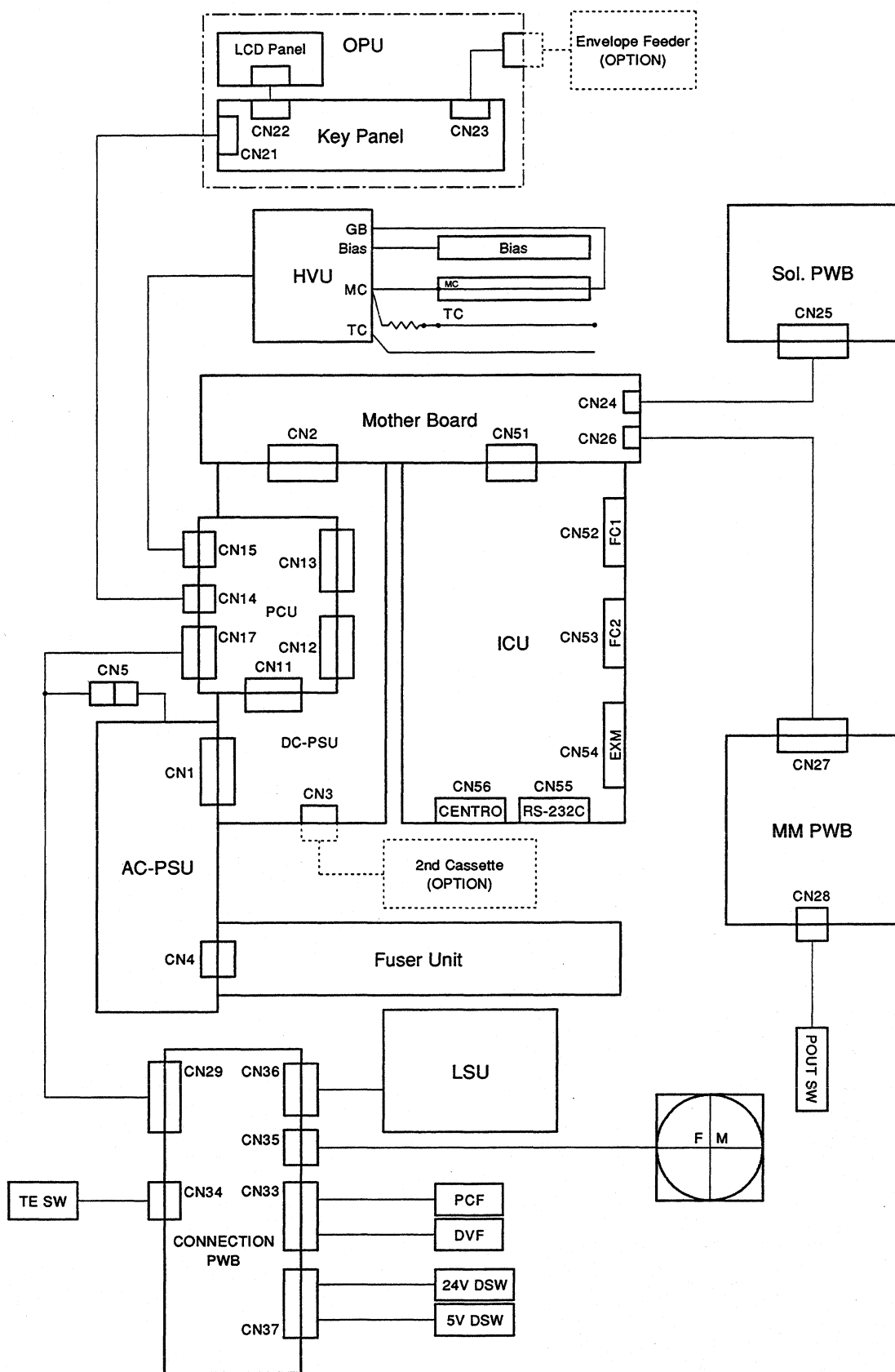
SHARP

TPB-H.V.O



[7] ICU P.W.B. (BOTTOM VIEW)

[8] WIRING DIAGRAM



[9] CONNECTOR SIGNAL NAME

CN1	AC-PSU~ DC-PSU
1	VH1
2	GND24
3	RTH
4	5VR
5	+12V
6	GND
7	-12V
8	GND
9	+5V
10	POUT
11	+24V
12	HLON

CN3	DC-PSU~ 2nd Cassette
1	+24V
2	PFMD
3	EXPE
4	EXPS2
5	EXCON
6	GND
7	EXPRS
8	EXPS1
9	EXPS3

CN11	DC-PSU~ PCU(1)
1	+5VR
2	RTH
3	VH1
4	VH1
5	+24V
6	+24V
7	GND24
8	GND24
9	+5V
10	+5V
11	+12V
12	-12V

CN14	PCU~ OPU
1	SDATA
2	SKOP
3	GND
4	GND24
5	+24V
6	+5V

CN15	PCU~HVU
1	MCON
2	WTB
3	TCON
4	+24VR
5	BiasON
6	PS1
7	GRLOW
8	PS2
9	+24V
10	PS3
11	GND24
12	GND
13	WTBF
14	NC

CN2	DC-PSU~Mother Board
1A	GND
2A	GND
3A	GND
4A	-12V
5A	RES
6A	READY
7A	SRDY
8A	HSYNC
9A	GND
10A	DATA
11A	CLK
12A	PE
13A	PSS
14A	POFF
15A	CRDY
16A	STS
1B	+5V
2B	+5V
3B	+5V
4B	+12V
5B	POUT
6B	MMTLK
7B	MMMD
8B	GND24
9B	+24V
10B	NC
11B	HFIN
12B	PFS
13B	PIN
14B	PRIM
15B	PAGE
16B	CMD

CN12	DC-PSU~ PCU(2)
1	CLK
2	HFIN
3	MMMD
4	MMTLK
5	POUT
6	EXPS
7	EXPS1
8	EXPS3
9	EXCON
10	PFMD
11	EXPE
12	EXPS2
13	GND
14	GND
15	HLON

CN4	AC-PSU~ Fuser Unit
1	RTH
2	+5VR
3	NC
4	NC
5	NC
6	HLN
7	HLL

CN5	AC-PSU~PCU, CONNECTION PWB
1	+24V
2	+24V

CN13	DC-PSU~ PCU(3)
1	DATA
2	HSYNC
3	SRDY
4	READY
5	RES
6	STS
7	CMD
8	CRDY
9	PAGE
10	POFF
11	PRIM
12	PSS
13	PIN
14	PE
15	PFS

CN22	OPU (KEY Panel~LCD Panel)
1	DB7
2	DB6
3	DB5
4	DB4
5	DB3
6	DB2
7	DB1
8	DB0
9	E
10	R/W
11	RS
12	VO
13	+5V
14	GND

CN23	OPU~ Envelope Feeder
1	EPFE
2	EFCON
3	GND
4	EFMD
5	GND24
6	+24V

CN24	Mother Board~ Sol.PWB
1	GND24
2	+24V
3	PIN
4	PSS
5	PFS
6	PE
7	HFIN
8	NC(CN24)

CN26	Mother Board~ MM PWB
1	+24V
2	GND24
3	+5V
4	GND
5	MMMD
6	MMTLK
7	POUT

CN28	MM PWB~ POUT SW
1	POUT
2	POSV
3	GND

CN33	PC FUSE DV FUSE
1	PCF
2	24VR
3	DVF
4	24VR

CN34	TS SW
1	TE5V
2	TE
3	GND

CN35	Fan Motor
1	+24V
2	FMD

CN37	Door SW
1	+5V
2	LD5V(+5V)
3	+24V
4	VH1

CN36	LSU
1	+24V
2	LD5V(+5V)
3	PMTLK
4	FMD
5	SYNC
6	-12V
7	+12V
8	GND(VR)
9	VIDEO
10	LDON
11	GND
12	GND24

[10] SIGNAL GUIDE

Signal name	Circuit block	Term
A	CPU	Address bus
ACK	I/F (centronics I/F)	Acknowledge
AS	CPU	Address strobe
AUTOFEED	I/F (centronics I/F)	Autofeed
BER	CPU	Bus error
BIASON	PCU	Bias ON
BUSY	I/F (centronics I/F)	Busy
BUZ	Operation	Buzzer
CGADR	D.P.	CG address
CGCAS	D.P.	CG column address strobe
CGCS	D.P.	CG chip select
CGD	D.P.	CG data bus
CGOE	D.P.	CG output enable
CGON1 ~ 2	I/F	CG (Font cartridge) ON 1 ~ 2
CGRAS	D.P.	CG raw address strobe
CGRDY	D.P.	CG ready
CGWE	D.P.	CG write enable
CLK	PCU	Clock
CLK16	D.P.	Clock 16MHz
CLK8	CPU	Clock 8MHz
CMD	I/F (PCU)	Command
CPURES	CPU	CPU Reset
CRDY	I/F (PCU)	Command ready
CRFSH	D.P.	CG refresh
D	CPU	Data bus
DATA	I/F (PCU)	(Print) data
DB0 ~ 7	Operation	Data bus
DOP	PCU	Door (Cover) open
DRAW	D.P.	Draw
DSR	I/F (RS232C)	Data set ready
DT1 ~ 8	I/F (centronics I/F)	Data 1 ~ 8
DTACK	CPU	Data transfer acknowledge
DTR	I/F (RS232C)	Data terminal ready
DVF	PCU	Developer cartridge fuse
E	CPU	Enable
E	Operation	Enable
EFCON	Operation	Envelope feeder connection
EFMD	Operation	Envelope feeder motor drive
EFPE	Operation	Envelope feeder paper empty
EXCON	PCU	2nd cassette connection
EXPE	PCU	2nd cassette paper empty
EXPFS	PCU	2nd cassette paper feed solenoid
EXPS1 ~ 3	PCU	2nd cassette paper size
EXTF	PCU	External clock (to CPU)
FAULT	I/F (centronics I/F)	Fault
FC0 ~ 2	CPU	Function code output
FCDOS1 ~ 2	I/F	Font card chip select
FCDOE	Memory	Font card Data output enable
FD	Memory	Font (card) data
FEN1	Memory	Font card enable 1
FEN2	Memory	Font card enable 2
FMD	PCU	Fan motor drive
FP1 ~ 2	Memory	Font card power supply
FVC1 ~ 2	Memory	Font card power supply
G1	I/F	EXM chip select

Signal name	Circuit block	Term
G2A	I/F	EXM chip select
GRLON	PCU	Grid ON
HFIN	PCU	Hand feed in
HL ON	PCU	Heater lamp ON
HSYNC	D.P.	Horizontal synchronization
INPUTPRIM	I/F (centronics I/F)	Inputprime
IPCS	D.P.	Image processor chip select
IPDTACK	D.P.	Image processor data transfer acknowledge
IPL0 ~ 2	CPU	Interrupt priority level
IPRES	D.P.	Image processor reset
IRQ	D.P.	Interrupt Request
LDON	PCU	Laser diode ON
LDS	CPU	Lower data strobe
MA	Memory	Resident CGROM, font card address
MC ON	PCU	Main corona ON
MCASL	Memory	Memory (standard DRAM) CAS lower
MCASU	Memory	Memory (standard DRAM) CAS upper
MMD	PCU	Main motor drive
MMTLK	PCU	Main motor lock
MOE	Memory	Memory (standard DRAM) output enable
MRAS	Memory	Memory (standard DRAM) RAS
NVCLK	I/F (NVRAM)	NVRAM clock
NVCS	I/F (NVRAM)	NVRAM chip select
NVDI	I/F (NVRAM)	NVRAM data input
NVDO	I/F (NVRAM)	NVRAM data output
NVR	I/F (NVRAM)	NVRAM recall
NVS	I/F (NVRAM)	NVRAM store
OBTEN	D.P.	Obtain enable
PAGE	D.P.	Page
PCF	PCU	Photoconductor (Drum) cartridge fuse
PClk	D.P.	Print data clock
PDATA	D.P.	Print data
PE	I/F (centronics I/F)	Paper empty
PE	PCU	Paper empty
PFMD	PCU	Paper feed motor drive
PFS	PCU	Paper feed solenoid
PGRCS	I/F	Program ROM chip select
PIN	PCU	Paper in
PMD	PCU	Polygon motor drive
PMTLK	PCU	Polygon motor lock
P-OFF	I/F (PCU)	Power off
POR	D.P.	Power on reset
POUT	PCU	Paper out
PRIM	I/F (PCU)	Prime
PS1 ~ 3	PCU	Peper size
PSS	PCU	Paper stop solenoid
RA	D.P.	Ring buffer address
RCAS	D.P.	Ring buffer CAS
RD	D.P.	Ring buffer data
RD	I/F	Read
READY	I/F (PCU)	Ready
RESIN	CPU	Reset
RJDCS	Memory	Resident CGROM chip select
ROE	D.P.	Ring buffer output enable
ROMOE	Memory	Resident CGROM output enable
RRAS	D.P.	Ring buffer RAS
RS	Operation	Resistor select

Signal name	Circuit block	Term
RTH	PCU	Thermistor
RTS	I/F (RS232C)	Request to send
R/W	CPU	Read/write
RWE	D.P.	Ring buffer write enable
RXD	I/F (RS232C)	Received data
S1 ~	Operation	Strobe
SCKOP	PCU	Serial clock for Operation circuit
SDATA	PCU	Serial data for operation circuit
SLCT	I/F (centronics I/F)	Select
SLCTIN	I/F (centronics I/F)	Select input
SRDY	I/F (PCU)	Status ready
STB	I/F (centronics I/F)	Strobe
STS	I/F (PCU)	Status
SYNC	PCU	Synchronization
TC ON	PCU	Transfer corona ON
TCLK	I/F (NVRAM)	Timer clock
TE	PCU	Toner empty
TXD	I/F (RS232C)	Transmitted data
UDS	CPU	Upper data strobe
VIDEO	PCU	Video
VPA	CPU	Valid Peripheral address
WTB	PCU	Waste toner box
WTF	PCU	Waste toner box fuse

SHARP PARTS GUIDE



V16950

CODE : 00ZJX9500PG-M

MODEL JX-9500

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- | | |
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| 1 Exteriors | 8 Cassette |
| 2 General | 9 Packing material & Accessories |
| 3 Upper frame section | 10 Operation PWB |
| 4 Main frame section | 11 PCU PWB |
| 5 Paper feeding unit | 12 ICU PWB |
| 6 FD tray unit | 13 Other parts |
| 7 Fusing section | ■ Index |



SHARP CORPORATION

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市場における補修部品の在庫管理が、適正に運営出来る手助けとなることを、目的とします。

Aランク：取替頻度が比較的多く、在庫を必要とするパーツ。

Bランク：取替頻度は比較的少ないが、在庫を必要とするパーツ。

Cランク：取替頻度はほとんどないと思われるパーツ。

Dランク：取替頻度はほとんどないが新品再生に必要なパーツ。

Eランク：ユニットパーツ。サービス効率アップの為、在庫する事を推奨するパーツ。

Sランク：消耗品

但し、複写機のパーツについては、同一パーツ名であっても、下記パーツは、使用箇所の相違により、A・Bランク分けします。

パーツ名：金属性のギヤー、スプロケット、ベアリング、ゴム製のベルト、スプリングクラッチ機構

Aランク：常に回転しているか、負荷がかかっている箇所に使用され、回転回数が増える事により、変形又は摩耗が生じその性能が発揮出来なくなるパーツ。

Bランク：回転部分に使用されているが、摩耗度が比較的少ないパーツ。

DEFINITION

The definition of each Rank is as follows and also noted in the list

A : Parts necessary to be stocked as High usage parts.

B : Parts necessary to be stocked as Standard usage parts.

C : Low usage parts.

D : Parts necessary for refurbish.

E : Unit parts recommended to be stocked for efficient after sales service.

Please note that the lead time for the said parts may be longer than normal parts.

S : Consumable parts.

Please note that the following parts used in Copier under the same description are classified into A or B Rank depending upon the place used.

Example : Gear made of Metal, Sprocket, Bearing, Belt made of Rubber, Spring clutch mechanism.

A Rank : The parts which may be with the revolution or loading.

B Rank : Parts similar to A Rank parts, but are not included in Rank A.

安全性・信頼性確保のため部品は、必ず正規のものをご使用下さい。

△印の商品は、安全上重要な部品です。交換する時は、安全および性能維持のため必ず指定の部品をご使用下さい。

Parts marked with "△" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

- jX-9500のサービス資料には、この資料以外にサービスマニュアルがあります。
合せて御利用下さい。
- Other than this Parts Guide, please refer to documents Service Manual for jX-9500.
- Please use 13 digits code described in the right hand corner of front cover of the document, when you place an order.

For U.S. only-Use order codes provided in advertising literature.

Do not order from parts department.



このパーツガイドは、データを情報のコンピュータより直接取り出し、電算写植システム(CPS: コンピュータ フォトタイプ システム)に乗せ、自動編集させ作ったものです。
Editon of this Parts Guide is made fully automatic by the computer phototype system ·CPS· whose printout data are directly picked up from the Sharp's main computer bank.

1 Exteriors

NO.	PARTS CODE	PRICE RANK		NEW MARK	PART RANK	DESCRIPTION
		Ex	Ja			
1	LSOU-0077FCZZ	AH	DX	N	C	FD support tray FDホジョトレイ
2	GCAB-0630FCZZ	AV	FL	N	D	Upper exterior ウエキヤビネット
3	GCAB-0632FCZZ	AQ	ET	N	D	Right exterior ミギヤビネット
4	CCAB-0629FC01	AT	FF	N	D	Front exterior マエキヤビネット
5	CPWBF0776FC51	BK	HV	N	E	Operation PWB ソウサキバン
6	HPNLC0185FCZZ	AF	DM	N	C	Key panel キーパネル
7	HINDP0270FCZZ	AK	DX	N	C	Key sheet キーシート
8	VVLLM16155K-1	AZ	GD		B	LCD LCD
9	CCAB-0631FC31	AS	FA	N	D	Left exterior (This includes No.10) ヒダリヤビネット
10	GC0VH0187FCZZ	AC	DE	N	C	EXM cover EXMカバー
11	DHAI-1675FCZZ	AB	DB	N	C	Upper lower joint harness ウエシタ レンケツハーネス
12	XBPBZ40P06K00	AA	DA		C	Screw (4×6K) ビス
16	RC-K1E104ACZZ	AA	DA		C	Capacitor コンデンサー
17	LX-BZ0375FCZZ	AA	DA		C	Screw ビス
18	PCAPH0033FCZZ	AC	DE	N	C	Connector cap (6pin) コネクタキャップ
19	PMLT-0797FCZZ	AC	DC	N	C	Optical unit cushion U コウガクユニットモルト U
20	LHLDW1098HCZZ	AB	DC		C	Wire clamp ワイヤークランプ
21	PSPAZ0529FCZZ	AC	DE	N	C	Optical spacer コウガクスペーサー

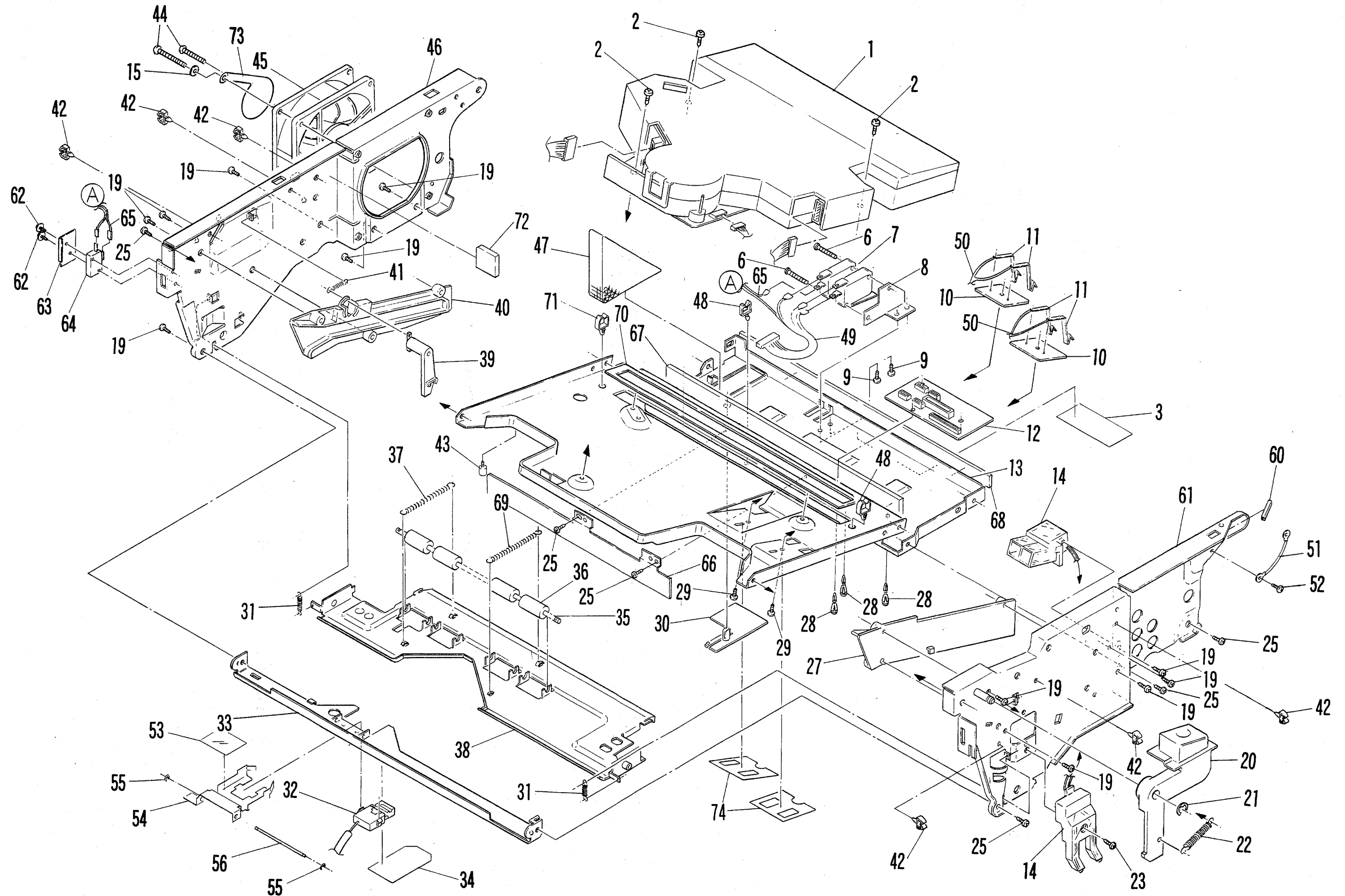
2 General

NO.	PARTS CODE	PRICE RANK		NEW MARK	PART RANK	DESCRIPTION
		Ex	Ja			
1	LX-BZ0376FCZZ	AA	DA		C	Screw ビス
2	LX-BZ0344FCZZ	AA	DA		C	Screw ビス
△	DUNTW6244FC11	BN	LR	N	E	Fusing unit (110V) テイチャクユニット
△	DUNTW6244FC13	BN	LR	N	E	Fusing unit (120V) テイチャクユニット
△	DUNTW6244FC14	BN	LR	N	E	Fusing unit (127V) テイチャクユニット
△	DUNTW6244FC15	BN	LR	N	E	Fusing unit (220/240V) テイチャクユニット
△	CPWBF0771FC31	BT	NV	N	E	AC power supply PWB (100V series) ACデンゲン
△	CPWBF0771FC32	BU	NZ	N	E	AC power supply PWB (200V series) ACデンゲン
△	CPWBF0771FC33	BT	NV	N	E	AC power supply PWB (127V) ACデンゲン
5	XEBSD30P08000	AA	DA		C	Screw (3×8) ビス
6	PC0VH0940FCZZ	AG	DU	N	C	PS cover デンゲンカバー
7	CSPRB1502FC31	AW	FR	N	C	Torsion spring unit トーシヨンスプリング
8	DHAI-1609FCZZ	AF	DP	N	C	OPU harness OPUハーネス
9	CGIDM1064FC31	AS	FC	N	C	Separator guide A unit ハクリガイド A ユニット
10	CGIDH1059FC31	BN	LR	N	E	Paper feeding unit キュウシユニット
11	LHLDW0734FCZZ	AA	DA		C	Cable holder ワイヤークランプ

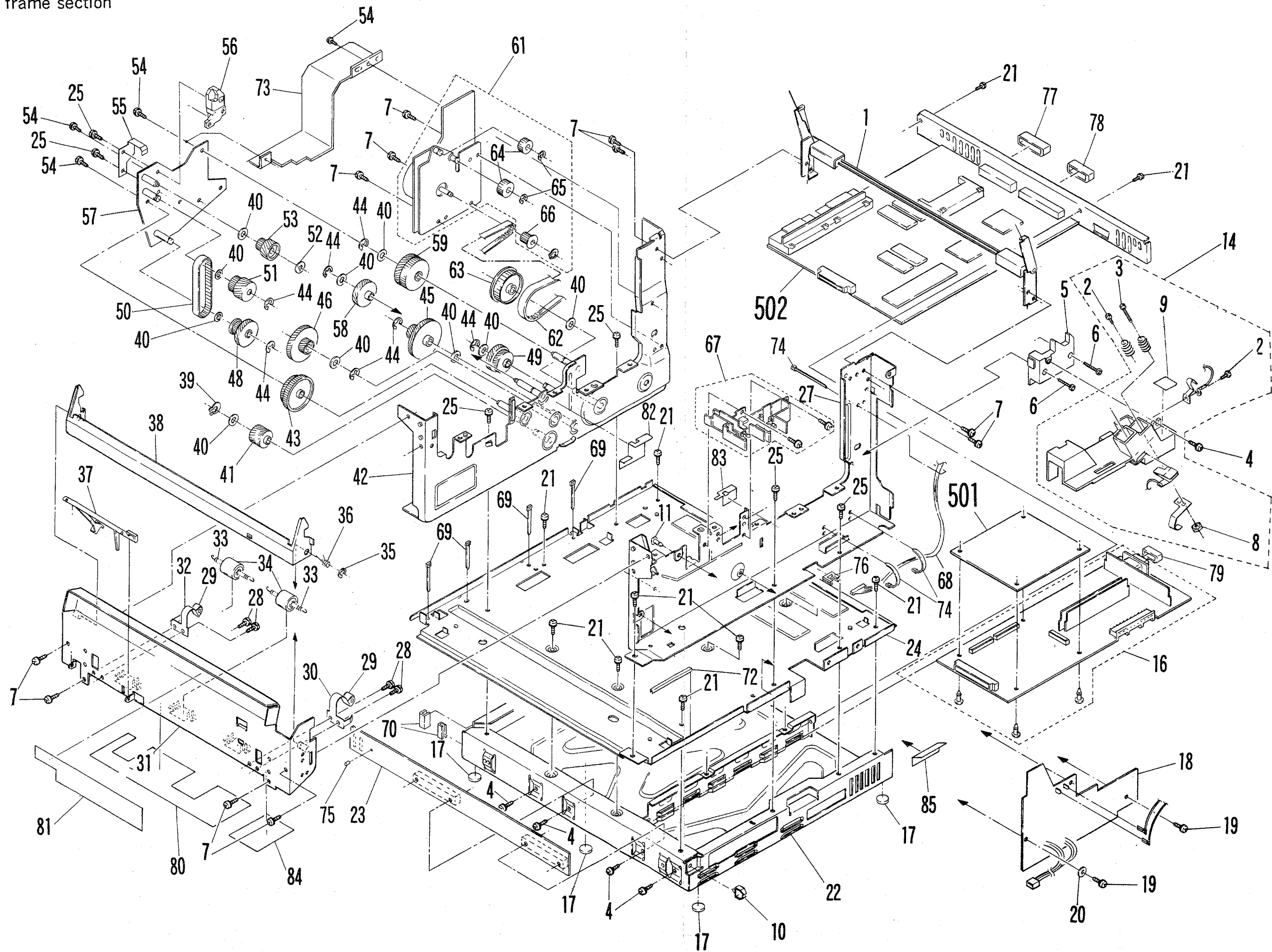
3 Upper frame section

NO.	PARTS CODE	PRICE RANK		NEW MARK	PART RANK	DESCRIPTION
		Ex	Ja			
1	DUNT-6240FCZZ	CD	UH	N	E	Laser unit
2	XHPSE40P10000	AA	DA		C	Screw (4×10)
3	TCAUS0887FCZZ	AC	DD	N	D	Laser caution label 4 (200V series)
6	XBPSD30P25000	AA	DA		C	Screw (3×25)
7	QSW-M0395FCZZ	AG	DS	N	B	Door switch (100V series)
7	QSW-M0396FCZZ	AK	DY	N	B	Door switch (200V series)
8	LPLTM3229FCZZ	AD	DF	N	C	Open switch plate
9	XHPSD30P08000	AA	DA		C	Screw (3×8)
10	LHLDZ0948FCZZ	AB	DC	N	C	Terminal holder
11	QSLP-0127FCZ1	AC	DD	N	C	Fuse terminal
12	CPWBF0806FC31	AS	FC	N	E	Division PWB (100V series)
12	CPWBF0806FC32	AS	FB	N	E	Division PWB (200V series)
13	CDAIU0359FC01	AW	FS	N	C	Optical stand unit A
14	CCOVP0948FC31	AR	EY	N	C	MC-G terminal cover unit
15	XWHS040-08100	AA	DA		C	Washer
19	XEBSD30P08000	AA	DA		C	Screw (3×8)
20	LFIx-0336FCZ1	AD	DG	N	C	Lock fixing plate
21	XRESP70-08000	AA	DA		C	E type ring (7E)
22	MSPRC1498FCZZ	AA	DA	N	C	Lock pawl spring
23	XHPSD30P10000	AA	DA		C	Screw (3×10)
25	LX-BZ0376FCZZ	AA	DA		C	Screw (3×8)
27	PGIDM1056FCZ1	AD	DF	N	C	Cartridge guide R
28	PSPAN1007ACZZ	AB	DB		C	Spacer
29	XEPSD30P06000	AA	DA		C	Screw (3×6)
30	LPLTM3034FCZZ	AB	DC	N	C	Filter plate
31	MSPRT1503FCZ1	AA	DA	N	C	Tension spring L
32	QSW-Z0388FCZZ	AQ	ET	N	B	Toner sensor switch
33	CGIDH1058FC01	AM	ED	N	C	Paper guide C
34	PSHEP2299FCZZ	AB	DB	N	C	Sensor sheet
35	NSFTZ1205FCZ1	A	FN	N	C	PS shaft
36	NR0LP0686FCZ1	AB	DC	N	C	PS roller
37	MSPRT1708FCZZ	AA	DA	N	C	PS spring A
38	CGIDH1057FC01	AN	EH	N	C	Paper guide B
39	LSTPP0209FCZZ	AB	DB	N	C	Cartridge stopper
40	PGIDM1055FCZZ	AC	DE	N	C	Cartridge guide L
41	MSPRC1499FCZZ	AA	DA	N	C	Stopper spring
42	LHLDW1009ACZZ	AA	DA		C	Cable holder
43	LX-BZ0494FCZZ	AB	DC		C	Screw
44	XBPSD40P30000	AA	DA		C	Screw (4×30)
45	NFANP0027FCZZ	AW	FR	N	C	Fan
46	LFRM-0551FCZZ	AR	EX	N	C	Upper frame L
47	PFILZ0136FCZ1	AK	DY	N	C	Ozone filter
48	LHLDW0734FCZZ	AA	DA		C	Wire holder
49	DHAi-1676FCZZ	AG	DR	N	C	Door switch harness (100V series)
49	DHAi-1677FCZZ	AG	DS	N	C	Door switch harness (200V series)
50	DHAi-1678FCZZ	AD	DH	N	C	Fuse harness
51	DHAi-1675FCZZ	AB	DB	N	C	Upper lower joint harness
52	XBPBZ40P06K00	AA	DA		C	Screw (4×6K)
53	PSHEP2443FCZZ	AB	DB	N	C	Sensor sheet B
54	LPLTM3437FCZZ	A	DN	N	C	Sensor plate
55	XRESP20-04000	AA	DA		C	E type ring (2mm)
56	NSFTZ1480FCZZ	AB	DC	N	C	Sensor shaft
60	PHOG-1009HCZZ	AA	DA		C	Edge bush
61	CFRM-0552FC01	AR	EZ	N	C	Upper frame R
62	XBPSD30P15KS0	AA	DA		C	Screw (3×15KS)
63	MLEVF0527FCZZ	AB	DC	N	C	Lock switch lever
64	QSW-M0400FCZZ	AG	DS	N	B	Door switch 2
65	DHAi-1732FCZZ	AD	DF	N	C	Lock switch harness (100V series)
65	DHAi-1733FCZZ	AD	DF	N	C	Lock switch harness (200V series)
66	LPLTM3520FCZZ	AG	DR	N	C	Plate
67	LFIx-0384FCZZ	AE	DK	N	C	Filter fixing plate
68	LFIx-0385FCZZ	AG	DT	N	C	Optical stand fixing plate
69	MSPRT1709FCZZ	AA	DA	N	C	PS spring B
70	PMLT-0791FCZZ	AD	DB	N	C	Optical unit cushion
71	LHLDW1006FCZZ	AA	DA	N	C	Wire clamp
72	PMLT-0796FCZZ	AC	DC	N	C	Optical unit cushion L
73	PCOVP0979FCZZ	AC	DD	N	C	Fan cover
74	PSHEP2561FCZZ	AC	DE	N	C	Terminal guide sheet

③ Upper frame section



4 Main frame section



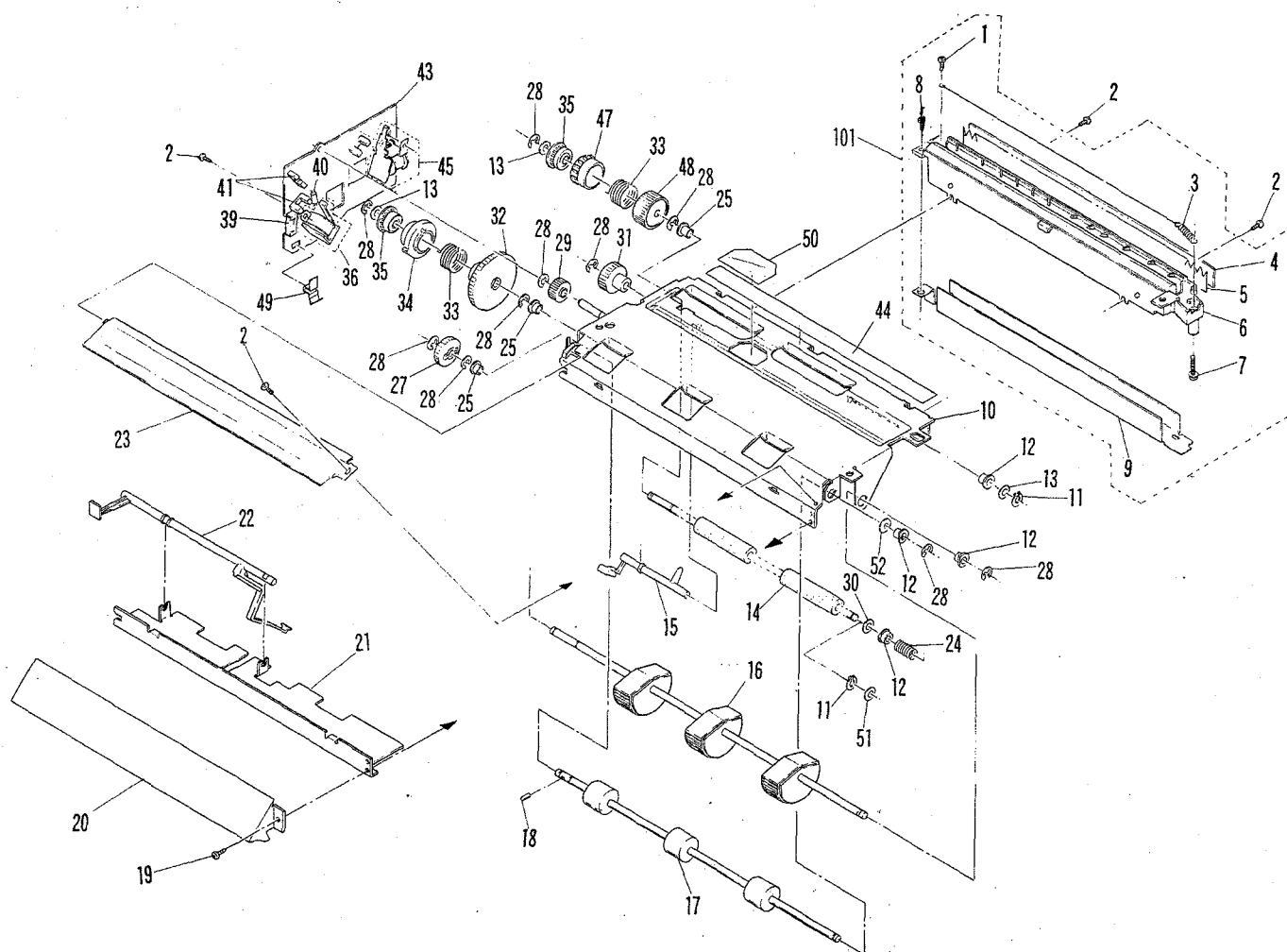
4 Main frame section

NO.	PARTS CODE	PRICE RANK		NEW MARK	PART RANK	DESCRIPTION	
		Ex	Ja				
1	CSPRB1502FC31	AW	FR	N	C	Torsion spring	トーションスプリング
2	XEBSD30P08000	AA	DA	N	C	Screw (3×8)	ビス
3	XBBS30P14000	AA	DA		C	Screw (3×14)	ビス
4	XEBSD30P08000	AA	DA		C	Screw (3×8)	ビス
5	LHLDZ0918FCZZ	AE	DJ	N	C	DR holder R	DRホルダーR
6	XHBSD30P18000	AA	DA		C	Screw (3×18)	ビス
7	XHBSE30P08000	AA	DA		C	Screw (3×8)	ビス
8	XNESD30-24000	AA	DA		C	Nut	ナット
9	TCAUH0839FCZZ	AA	DA		D	Caution label	コウオンチュウイラベル
10	LHLDW0734FCZZ	AA	DA		C	Cable holder	ワイヤクランプ
11	PSPAK2331RCZZ	AA	DB		C	Spacer (KGRS-6R)	スペーサー
14	CCOVP0947FC51	AN	EL	N	C	High tension cover ass'y	コウアツカバー クミヒン
16	CPWBF0772FC31	BL	LB	N	E	DC power supply	DCデンケンキバン
17	GLEGG0040FCZZ	AB	DB	N	C	Rubber foot	ゴムアシ
18	CPWBF0774FC31	BM	LL	N	E	High tension PWB	コウアツデンキバン
20	XWHS40-08100	AA	DA		C	Washer	ワッシャ
21	XHBSE30P06000	AA	DA	N	C	Screw (3×6)	ビス
22	CBOX-0065FC01	AW	FS	N	C	PWB box	キバンボックス
23	CPWBF0773FC31	AW	FR	N	E	Mother board PWB	マザーボードキバン
24	LDAIU0358FCZZ	AT	FH	N	C	PWB frame stand	キバンフレームダイ
25	XEBSD30P06000	AA	DA		C	Screw (3×6)	ビス
27	LFRM-0550FCZZ	AR	FA	N	C	Lower frame R	シタフレーム R
28	XBBS30P04000	AA	DA		C	Screw (3×4)	ビス
29	NROLP0729FCZZ	AB	DB	N	C	DSD roller	DSDヨウ ローラー
30	MSPRP1592FCZZ	AD	DF	N	C	DSD spring R	DSDヨウ イタパネ R
31	CPLTM3033FC01	AR	EZ	N	C	Lock plate ass'y	ロックシジバンクミヒン
32	MSPRP1497FCZZ	AD	DF	N	C	DSD spring L	DSDヨウパネ L
33	MSPRT1710FCZZ	AA	DA		C	PF spring A	PFジュウドウスプリングA
34	NROLP0591FCZZ	AA	DA		C	PF-B pressure roller	PF-Bアッチャクローラー
35	XRESP60-07000	AA	DA		C	E type ring	Eリング
36	MSPRC1496FCZZ	AA	DA	N	C	Lock plate spring	ロックバンスプリング
37	MLEVP0465FCZZ	AC	DD	N	C	Pinch lever	ピンチクチュエーター
38	PTME-0188FCZZ	AL	EC	N	C	Lock pawl	ロックゾメ
39	PRNGP0025FCZZ	AA	DA		C	G ring (GTW-5)	G リング
40	LX-WZ5002BCZZ	AA	DA		C	Washer	ワッシャ
41	NGERH0595FCZZ	AC	DC	N	C	Gear (52T)	ギヤ52
42	CFRM-0548FC01	AW	FS	N	C	Lower frame L	シタフレーム L
43	NGERH0594FCZZ	AC	DE	N	C	Gear (26/52T)	ギヤ
44	XRESP50-06000	AA	DA	N	C	E type ring (5mm)	Eリング
45	NGERH0590FCZZ	AD	DF	N	C	Gear (17/96T)	ギヤ
46	NGERH0591FCZZ	AD	DF	N	C	Gear (17/50T)	ギヤ
47	XHBSD30P08000	AA	DA		C	Screw (3×8)	ビス
48	NGERH0597FCZZ	AC	DE	N	C	Pulley gear (53×22T)	ギヤ53/プーリー-22
49	NGERH0592FCZZ	AC	DD	N	C	Gear (20/28T)	ギヤ
50	NBLTH0118FCZZ	AD	DF	N	C	DV timing belt	DVタイミングベルト
51	NGERH0598FCZZ	AB	DC	N	C	Pulley gear (21×22T)	ギヤ21/プーリー-22
52	LX-RZ1044HCZZ	AA	DA		C	Washer	CSガットメワ
53	NGERH0606FCZZ	AC	DC	N	C	Gear 16 (16T)	ギヤ16
54	XBPSD30P06000	AA	DA		C	Screw (3×6)	ビス
55	QEARP0036FCZZ	AC	DC	N	C	DR earth plate	DRアースプレート
56	LHLDZ0917FCZ1	AE	DK	N	C	DR holder L	DRホルダー L
57	CPLTM3193FC01	AL	EC	N	C	Sub plate	サブプレート
58	NGERH0593FCZ1	AB	DC	N	C	Gear (26T)	ギヤ26
59	NGERH0596FCZZ	AD	DG	N	C	Gear (34/34T)	ギヤ
61	CMOTN0565FC31	BF	HH	N	B	Main motor unit	メインモータークミヒン
62	NBLTH0117FCZZ	AD	DG	N	C	MM timing belt	MMタイミングベルト
63	NGERH0589FCZZ	AC	DE	N	C	Pulley gear	ギヤ23/プーリー-30
64	NGERH0599FCZZ	AB	DB	N	C	Gear 18	ギヤ18
65	XRESP40-06000	AA	DA	N	C	4E-Type ring (4mm)	Eリング
66	NPLYZ0174FCZZ	AB	DC	N	C	MM pulley (20M×L)	MMプーリー
67	CHLDZ0919FC51	AK	DX	N	C	High tension PWB holder	コウアツキバンホルダー
68	DHAI-1612FCZZ	AS	FF	N	C	Main harness	メインハーネス
69	LBNDJ5003BCZZ	AA	DA		C	Band	バンド
70	PHOG-2062SCZZ	AC	DC		C	Protector	ホゴブツ
72	LBSHC0095FCZZ	AB	DB		C	Bushing	ブッシング
73	PCOVP0970FCZZ	AF	DP	N	C	MM cover	MMカバー
74	LBNDJ2003SCZZ	AA	DA		C	Band	ケツク バンド
75	LHLDZ09120SCZZ	AA	DA		C	Cable holder	ケーブルホルダー
76	LHLDW0595FCZZ	AC	DC		C	Cable holder	ケーブルホルダー
77	PCAPH1001ACZZ	AE	DL		C	Connector protect cap (36pin)	コネクターホゴキャップ
78	PCAPH1003ACZZ	AC	DK		C	Connector cap	コネクターホゴキャップ
79	PCAPH0032FCZZ	AC	DE	N	C	Connector cap (9pin)	コネクターキャップ
80	PSHEP2566FCZZ	AD	DF	N	C	Lock plate sheet B	ロックシジバンマイラー-B
81	PSHEP2565FCZZ	AD	DG	N	C	Lock plate sheet A	ロックシジバンマイラー-A
82	PSHEP2581FCZZ	AF	DM	N	C	Sheet L	ボウジンマイラー-L
83	PSHEP2582FCZZ	AD	DG	N	C	Sheet R	ボウジンマイラー-R
84	PSHEP2597FCZZ	AB	DC	N	C	Lock plate sheet C	ロックシジバンマイラー-C
85	PSHEP2535FCZZ	AC	DE	N	C	Frame base plate sheet	フレームダイバンマイラー
501	CPWBS0779FC51	BV	RL	N	E	PCU PWB	PCU キバン
502	CPWBN0735FC51	CN	VG	N	E	ICU PWB	ICU キバン

5 Paper feeding unit

NO.	PARTS CODE	PRICE RANK		NEW MARK	PART RANK	DESCRIPTION
		Ex	Ja			
1	XEPSD30P05000	AA	DA	N	C	Screw (3×5) ビス
2	XHPSD30P06000	AA	DA	N	C	Screw (3×6) ビス
3	MSPRC1506FCZZ	AA	DA	N	C	TC spring TC スプリング
4	PGIDM1063FCZZ	AE	DK	N	C	Separator guide A ハクリガイドA
5	PSHEZ2450FCZZ	AH	DX	N	C	Separator sheet ハクリマイラー
6	PCASZ0184FCZZ	AF	DP	N	C	TC case A TCケース A
7	XEPSN30P20000	AA	DA	N	C	Screw (3×20) ビス
8	LX-BZ0344FCZZ	AA	DA	N	C	Screw ビス
9	PCASZ0185FCZZ	AG	DS	N	C	TC case B TCケース B
10	CGIDH1059FC01	AQ	EU	N	C	Paper guide unit ペーパーガイドユニット
11	PRNGP0025FCZZ	AA	DA	N	C	G ring グリリング
12	NBRGP0266FCZZ	AA	DA	N	C	Bearing (φ5) ジクウケ
13	LX-WZ5028BCZZ	AA	DA	N	C	Washer (5.2×10×0.5) ワッシャ
	LX-WZ2019SCZZ	AA	DA	N	C	Washer (5.2×12×0.25) ワッシャ
	LX-WZ5018BCZZ	AA	DA	N	C	Washer (5.2×8×0.13) ワッシャ
14	NRÖLP0689FCZZ	AN	EJ	N	C	PS roller PSローラー
15	MLEVP0467FCZZ	AC	DD	N	C	PS lever PSアクチュエーター
16	NRÖLP0687FCZZ	AS	FB	N	C	PF roller A PFローラ A
17	NRÖLP0688FCZZ	AP	EP	N	C	PF roller B PFローラ B
18	LPINS0133FCZZ	AA	DA	N	C	Spring pin (φ2×10) ヘイコウピン
19	XHBSD30P08000	AA	DA	N	C	Screw (3×8) ビス
20	PGIDM1061FCZZ	AG	DT	N	C	U turn guide A Uターンガイド A
21	PGIDH1060FCZZ	AG	DS	N	C	Paper guide A2 ペーパーガイド A2
22	MLEVP0466FCZZ	AD	DF	N	C	PO lever A POアクチュエーターA
23	PGIDH1062FCZZ	AG	DS	N	C	U turn guide B Uターンガイド B
24	MSPRC1695FCZZ	AB	DB	N	C	PS brake spring PSブレーキスプリング
25	NBRGC0311FCZZ	AC	DE	N	C	M5 bearing metal M5ジクウケメタル
27	NGERH0600FCZZ	AB	DC	N	C	Gear (24T) ギヤ24
28	XRESP40-06000	AA	DA	N	C	E type ring (4mm) Eリング
29	NGERH0601FCZZ	AB	DB	N	C	Gear (18T) ギヤ18
30	XWHUW50-08120	AA	DA	N	C	Washer ワッシャ
31	NGERH0603FCZZ	AB	DC	N	C	Gear (23T) ギヤ23
32	NGERH0602FCZZ	AF	DM	N	C	Gear (54T) ギヤ54
33	MSPRC1580FCZZ	AD	DH	N	C	Clutch spring クラッチ スプリング
34	PPIPP0121FCZZ	AC	DC	N	C	CL sleeve CLスリーブ
35	LBÖSZ1031FCZZ	AC	DE	N	C	Clutch boss クラッチボス
36	RPLU-0229FCZZ	AN	EG	N	B	PF solenoid PFソレノイド
39	QCNCM0538FCZZ	AC	DD	N	C	Connector コネクター
40	VRD-RC2EY112J	AA	DA	N	C	Resistor (1/4W 1.1KΩ ±5%) テイコウ
41	VHPGP1S53//1	AF	DP	N	B	Photo transistor フォトトランジスター
43	CPWBF0778FC31	AY	FZ	N	E	Solenoid PWB ソレノイドキバン
44	PSHEP2555FCZZ	AE	DL	N	C	Guide sheet テンシャガイドシート
45	RPLU-0230FCZZ	AP	EL	N	B	PS solenoid PSソレノイド
47	PPIPP0108FCZ1	AB	DC	N	C	PS sleeve PSスリーブ
48	NGERH0604FCZZ	AE	DK	N	C	Gear (30T) ギヤ30
49	LPLTM3525FCZZ	AB	DB	N	C	PWB earth plate ソレノイドキバンアースバン
50	PSHEP2350FCZZ	AB	DB	N	C	PS sheet PSマイラー
51	LX-WZ0269FCZZ	AC	DC	N	C	Washer クラリーノワッシャ
52	LX-WZ1003HCZZ	AA	DA	N	C	Washer ボリスライダー
101	CCASZ0184FC31	AP	EQ	N	C	TC case A TCケースA
	ユニット (Unit)					
901	CGIDH1059FC31	BN	LR	N	E	Paper feeding unit キュウシ ユニット

5 Paper feeding unit



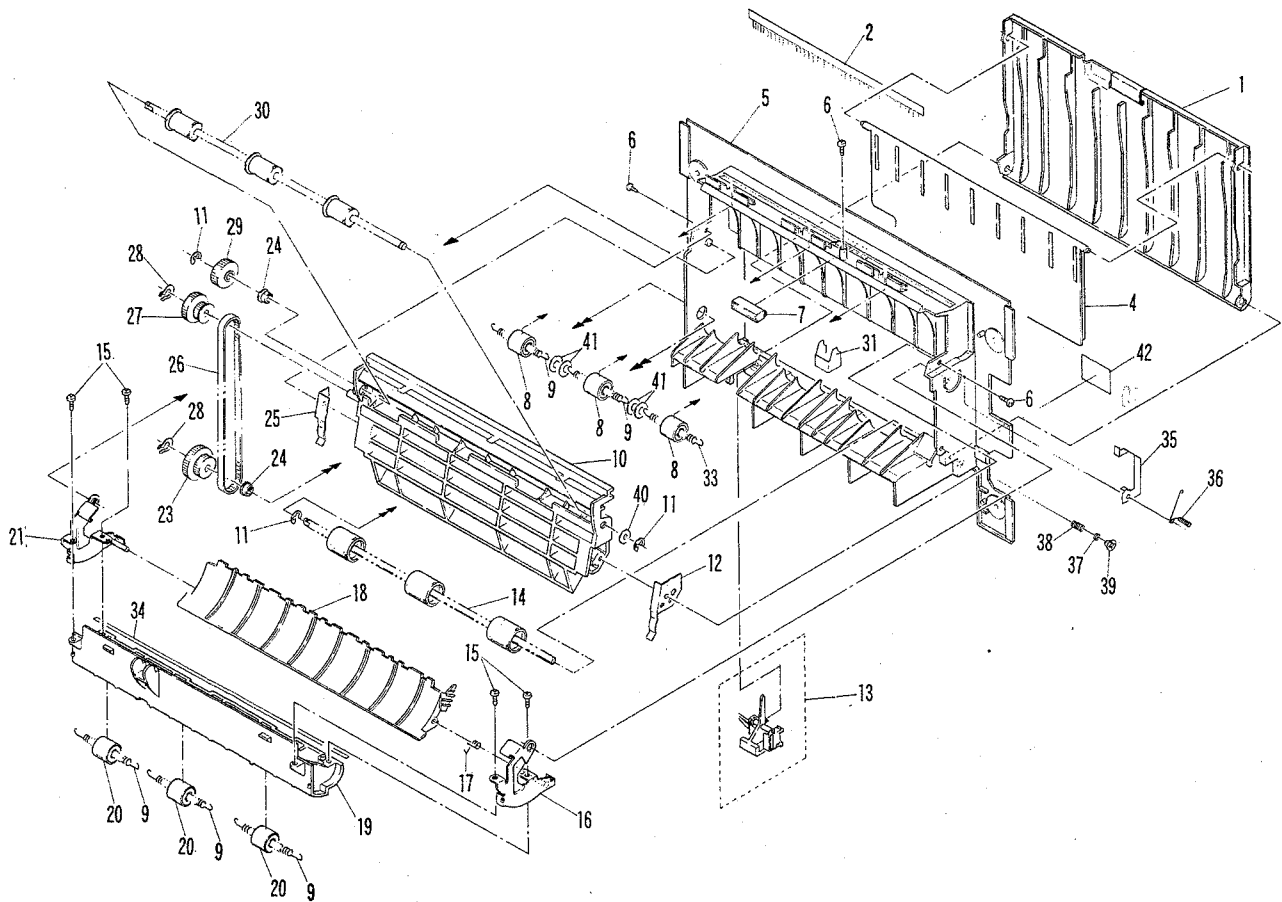
6 FD tray unit

NO.	PARTS CODE	PRICE RANK		NEW MARK	PART RANK	DESCRIPTION
		Ex	Ja			
1	CSOU-0078FC01	AK	DZ	N	C	Face up tray 1 ass'y
2	PBRSD0098FCZZ	AF	DP	N	C	Electrostatic discharger brush
4	LSOU-0079FCZZ	AE	DL	N	C	Face up tray (2/2)
5	CFRM-0553FC01	AU	FJ	N	C	FD frame
6	XEBSD30P08000	AA	DA		C	Screw (3X8)
7	PMAG-0021FCZZ	AF	DM		C	Magnet catch
8	NROLP0529FCZZ	AA	DA		C	Roller N
9	MSPRC1509FCZZ	AA	DA	N	C	FD spring
10	PGIDM1065FCZZ	AH	DW	N	C	FD guide
11	XRESP40-06000	AA	DA	N	C	E type ring (4mm)
12	MSPRT1604FCZZ	AC	DD	N	C	FD tension spring R
13	CDTCT0078FC01	AM	EE	N	E	PO sensor
14	NROLP0690FCZZ	AM	EF	N	C	FD transfer roller
15	XEPSD30P06000	AA	DA		C	Screw (3X6)
16	CPLTM3216FC01	AF	DP	N	C	FD guide plate R ass'y
17	MSPRC1595FCZZ	AA	DA	N	C	FD chang spring
18	PGIDM1066FCZZ	AG	DS	N	C	Paper turn guide
19	PGIDM1126FCZZ	AH	DV	N	C	FD guide B
20	NROLP0591FCZZ	AA	DA		C	PF-B pressure roller
21	CPLTM3215FC01	AF	DP	N	C	FD guide plate L ass'y
23	NPLYZ0182FCZZ	AB	DB	N	C	Gear pulley (21/24T)
24	NBRGC0343FCZZ	AB	DB	N	C	FD drive bearing (φ5)
25	MSPRT1603FCZZ	AC	DC	N	C	FD tension spring L
26	NBLTK2052SCZZ	AE	DM		C	Exit belt
27	NPLYZ0173FCZZ	AC	DE	N	C	Gear pulley (20/21T)
28	PRNGP0025FCZZ	AA	DA		C	G ring (GTW-5)
29	NGERH0638FCZZ	AB	DB	N	C	Gear (16T)
30	NROLP0691FCZZ	AM	EF	N	C	FD roller
31	PSHEP2442FCZZ	AB	DB	N	C	PO sensor protection sheet
33	MSPRC1702FCZZ	AA	DA	N	C	FD spring B
34	PSHEP2568FCZZ	AB	DB	N	C	FD earth sheet C
35	PSHEP2569FCZZ	AB	DC	N	C	FD earth sheet D
36	MSPRC1713FCZZ	AB	DB	N	C	FD earth spring C
37	MSPRC1711FCZZ	AA	DA	N	C	FD earth spring A
38	MSPRC1712FCZZ	AA	DA	N	C	FD earth spring B
39	LPIINS0217FCZZ	AB	DC	N	C	Pin
40	LX-WZ5018BCZZ	AA	DA		C	Washer
41	XWHS40-08100	AA	DA		C	Washer
42	TCAUH0891FCZZ	AA	DA	N	D	Caution label

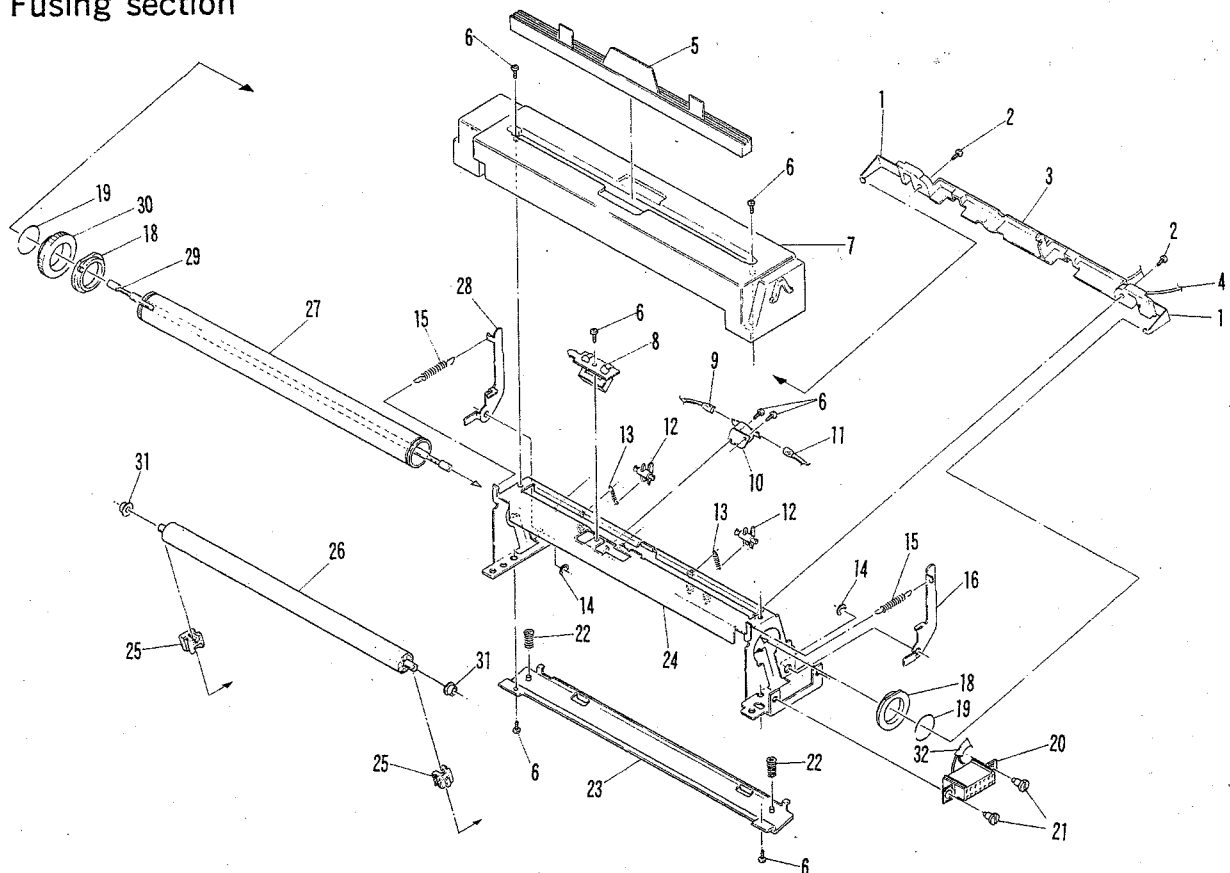
7 Fusing section

NO.	PARTS CODE	PRICE RANK		NEW MARK	PART RANK	DESCRIPTION
		Ex	Ja			
1	MSPRP1510FCZZ	AD	DF	N	C	Lamp spring
2	XHPSD30P08000	AA	DA		C	Screw (3X8)
3	PCOV0946FCZ1	AF	DQ	N	C	Stand cover
4	DHAI-1626FCZZ	AA	DA	N	C	Fusing harness C
5	LHLDZ0920FCZZ	AK	DY	N	C	Felt holder
6	XHPSD30P05000	AA	DA		C	Screw (3X5)
7	CCOVQ0907FC02	AP	EN	N	C	Heater cover
8	CDTCT0075FC01	AR	EW	N	E	Thermistor unit
9	DHAI-1606FCZZ	AC	DC	N	C	Fusing harness B
10	CTHM-0011FC01	AK	DY	N	C	Thermostat
11	DHAI-1605FCZZ	AC	DD	N	C	Fusing harness A
12	PTME-0191FCZZ	AF	DP	N	C	Separator pawl
13	MSPRC1512FCZZ	AA	DA	N	C	Separator pawl spring
14	XRESP40-06000	AA	DA		C	E type ring (4E)
15	MSPRC1581FCZZ	AB	DC	N	C	Release lever spring
16	MLEVF0494FCZZ	AD	DH	N	C	Pressure release lever R
18	NBRGP0259FCZZ	AE	DK		C	Fusing bearing
19	LSTPP0116FCZZ	AA	DA		C	Roller stopper
20	QCNCM0333FCZZ	AD	DF	N	C	Connector
21	LX-BZ0487FCZZ	AA	DA		C	Screw
22	MSPRC1511FCZZ	AA	DA	N	C	Pressure roller spring
23	LPLTM3040FCZZ	AD	DH	N	C	Under plate
24	LPLTM3039FCZZ	AK	EA	N	C	Base plate
25	NBRGP0331FCZ1	AD	DG	N	C	Pressure bearing
26	NROLI0692FCZ1	AV	FN	N	C	Pressure roller
27	NROLT0693FCZZ	AW	FT	N	C	Heat roller
28	MLEVF0469FCZZ	AD	DH	N	C	Pressure release lever
29	RLMPU0405FCZZ	AX	FV		B	Heater lamp (110V)
	RLMPU0406FCZZ	AX	FV		B	Heater lamp (120V)
	RLMPU0407FCZZ	AX	FV		B	Heater lamp (127V)
	RLMPU0408FCZZ	AX	FV		B	Heater lamp (220/240V)
30	NGERH0401FCZZ	AC	DD		C	Fusing gear
31	NBRGP0386FCZZ	AK	DX	N	C	Pressure roller bearing
32	PTUBG0089FCZZ	AA	DA	N	C	Glass tube
ユニット (Unit)						
901	DUNTW6244FC11	BN	LR	N	E	Fusing unit (110V)
	DUNTW6244FC13	BN	LR	N	E	Fusing unit (120V)
	DUNTW6244FC14	BN	LR	N	E	Fusing unit (127V)
	DUNTW6244FC15	BN	LR	N	E	Fusing unit (220/240V)

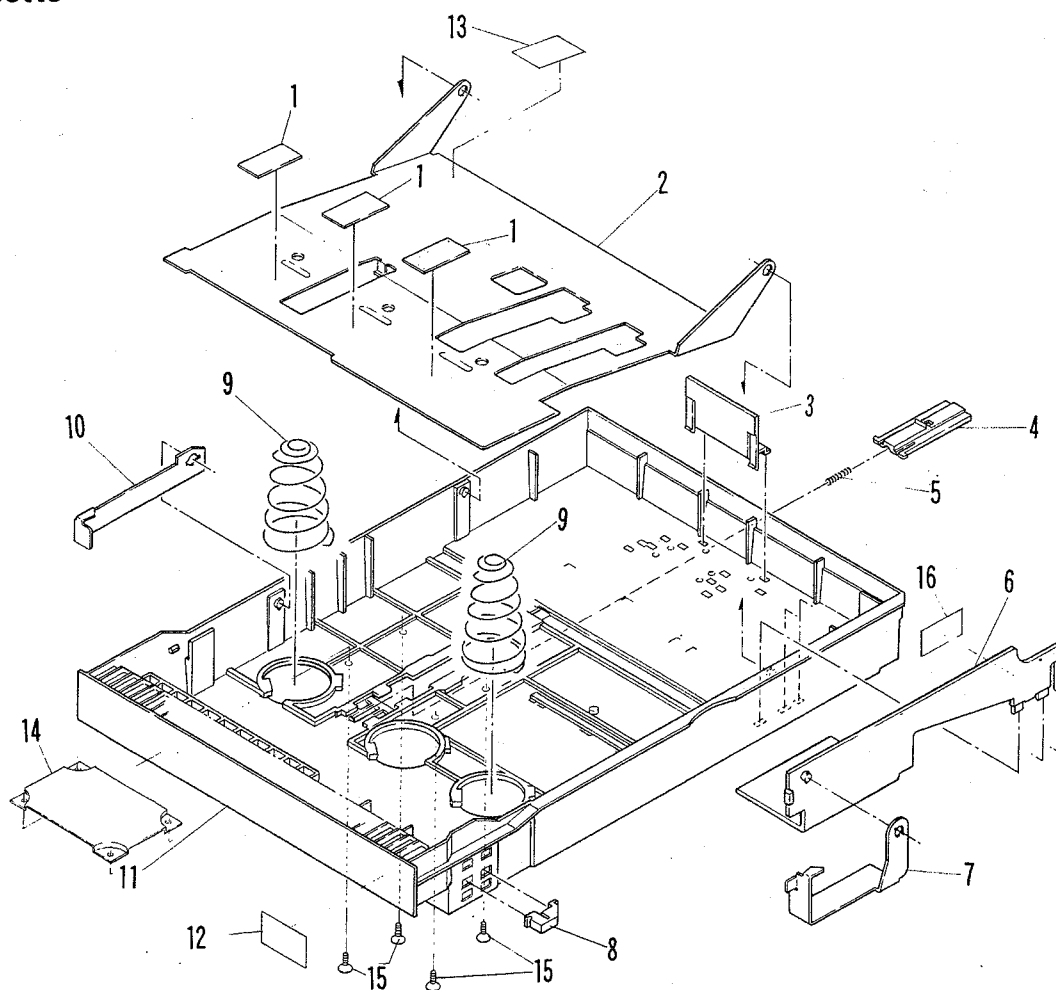
6 FD tray unit



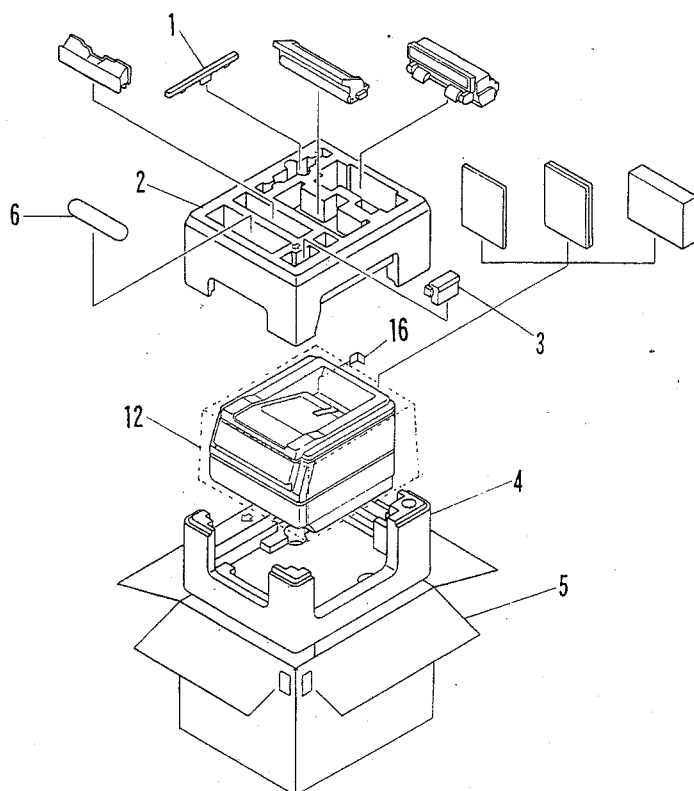
7 Fusing section



8 Cassette



9 Packing material & Accessories



8 Cassette

NO.	PARTS CODE	PRICE RANK		NEW MARK	PART RANK	DESCRIPTION
		Ex	Ja			
1	PSHEZ1606FCZZ	AB	DB		C	Cassette sheet カセットシート
2	LPLTM3036FCZZ	AN	EG	N	C	Cassette turning plate カセットカテンイタ
3	LPLTP3037FCZZ	AC	DD	N	C	Cassette rear plate カセットコウタンイタ
4	LSTPP0161FCZZ	AB	DC		C	Turning plate spring カテンイタ スプリング
5	MSPRC1145FCZZ	AA	DA		C	Stopper spring ストッパーヨウスプリング
6	LPLTP3035FCZZ	AF	DN	N	C	Cassette side plate カセットソクイタ
7	PTME-0189FCZZ	AF	DP	N	C	Cassette pawl R カセットツメ R
8	LDAIU0361FCZZ	AB	DB	N	C	Paper size stand カミケンチブロック
9	MSPRC1505FCZZ	AC	DC	N	C	Cassette spring カセットスプリング
10	PTME-0190FCZZ	AE	DJ	N	C	Cassette pawl L カセットツメ L
11	GCASP0145FCZZ	AQ	EV	N	D	Cassette カセット A
12	TLABZ2396FCZZ	AA	DA	N	D	Cassette size label (letter) カセットサイズラベル
12	TLABZ2393FCZZ	AA	DA	N	D	Cassette size label (A4) カセットサイズラベル
13	TLABH2400FCZZ	AB	DC	N	D	Cassette label カセットセツメイラベル
14	LPLTM3543FCZZ	AD	DG	N	C	Cassette plate カセットプレート
15	XHSSE30P06000	AA	DA		C	Screw (3×6) ビス
16	TLABZ2544FCZZ	AB	DB	N	C	Paper limit label ヨウシゲシンドラベル

9 Packing material & Accessories

NO.	PARTS CODE	PRICE RANK		NEW MARK	PART RANK	DESCRIPTION
		Ex	Ja			
1	LHLDZ0920FCZZ	AK	DY	N	C	Felt holder フェルトホルダー
2	SPAKA3823FCZZ	AQ	ET	N	D	Top packing cushion デン アド
3	CB0X-0067FC01	AK	EA	N	C	Waste toner box ハイトナボックス
4	SPAKA3824FCZZ	AN	EH	N	D	Bottom packing cushion ソゴ アド
5	SPAKC3826FCZZ	AP	EQ	N	D	Packing case パッキングケース
6	QACCJ9610QCZZ	AR	EW		B	AC cord(Japan plug) ACコード
	QACCV6620QCZZ	AV	FN		B	AC cord(φ4.8 2pin) [Germany] ACコード
	QACCD6611QCZZ	AW	FQ	N	B	AC cord(UL,CSA plug) [USA,Canada] ACコード
	QACCB7620QCN1	AX	FW		B	AC cord(BS plug) [U.Kingdom] ACコード
	QACCF7620QCZZ	AX	FU		B	AC cord [Singapore] ACコード
	QACCL7620QCZZ	AW	FK		B	AC cord [Australia,New Zealand] ACコード
	QACCD7613QCN5	AQ	EV		B	AC cord [USA] ACコード
	QCNW-0132FCZZ	AV	FN		B	AC coard(φ4.0 2pin) インレットACコード
	QCNW-0122FCZZ	AR	EW		C	AC cord [Saudi Arabia] (127V) ACコード
	QPLGA0002QCZZ	AN	EH		C	AC plug [Saudi Arabia] (127V) プラグ
	QTANP0096FCZZ	AA	DA		C	Terminal [Saudi Arabia] (127V) タンシ
	QACCB7521QCZZ	AS	EZ	N	B	AC cord [Hong Kong,South Africa,Srilanka] ACコード
	PH0G-1023CCZZ	AB	DB		C	Protect sleeve [Hong Kong,South Africa,Srilanka] プラグヨウホゴスリーブ
	QPLGA0018WRE0	AN	EG		C	AC plug [Hong Kong,South Africa,Srilanka] ACプラグ(ワットマル3P)
	SSAKA0002FCZZ	AA	DA		D	Vinyl bag for operation manual (300×420mm) トリセツヨウ ボリアクロ
16	SPAKA4091FCZZ	AB	DB	N	D	Fase up tray fixing F/Uトレイホゴザイ
101	UCLEZ0102FCZZ	AE	DJ	N	C	Charger cleaner チャージャークリーナ
102	SSAKA3001CCZZ	AA	DA		D	Vinyl bag (140×360mm) ボリアクロ
103	SSAKA2011KCZZ	AA	DA		D	Vinyl bag (60×100mm) ボリアクロ
104	SPAKA4103FCZZ	AD	DG	N	D	DV front cover DVフロントカバー
105	TINSE0743FCZZ	AW	FS	N	D	Operation label [USA] トリアツカイセツメイショ
	TINSE0744FCZZ	AV	FN	N	D	Operation label [English] トリアツカイセツメイショ
	TINSF0746FCZZ	AT	FG	N	D	Operation label [French] トリアツカイセツメイショ
	TINSS0747FCZZ	AT	FG	N	D	Operation label [Spanish] トリアツカイセツメイショ
	TINSO745FCZZ	AT	FG	N	D	Operation label [Germany] トリアツカイセツメイショ
	TINSI0749FCZZ	AT	FG	N	D	Operation label [Italy] トリアツカイセツメイショ
	TINSZ0750FCZZ	AT	FG	N	D	Operation manual [Sweden] トリアツカイセツメイショ

10 Operation PWB

NO.	PARTS CODE	PRICE RANK		NEW MARK	PART RANK	DESCRIPTION
		Ex	Ja			
1	RALMB0002FCZZ	AG	DS	N	B	Buzzer [BZ] IP-1A ブザー
2	VCEAEAI1AW476M	AB	DB	N	C	Capacitor (10WV 47μF) [C1] コンデンサー
3	VCKYPU1HB471J	AA	DA		C	Capacitor (50WV 470pF) [C2] コンデンサー
4	VCKYPU1HB471J	AA	DA		C	Capacitor (50WV 470pF) [C3] コンデンサー
5	VCKYPU1HB471J	AA	DA		C	Capacitor (50WV 470pF) [C4] コンデンサー
6	VCEAEU1CW106M	AA	DA		C	Capacitor (16WV 10μF) [C5] コンデンサー
7	VCCCPU1HH300J	AA	DB		C	Capacitor (50WV 30PF) [C6] コンデンサー
8	VCCCPU1HH300J	AA	DB		C	Capacitor (50WV 30PF) [C7] コンデンサー
9	DHAI-1609FCZZ	AF	DP	N	C	OPU harness [CN21] OPUハーネス
10	DHAI-1627FCZZ	AM	EF	N	C	EF harness [CN22] EFハーネス
11	DHAI-1611FCZZ	AB	DC	N	C	OPU joint harness [CN23] OPUレンケツハーネス
12	RCRM-1011CCZZ	AD	DG		B	Oscillator (4.19MHz) [CSA] セラミック ハッシンシ
13	VHDDSS133HV-1	AA	DA		B	Diode (1SS133) [D1] ダイオード
14	VHDDSS133HV-1	AA	DA		B	Diode (1SS133) [D2] ダイオード
15	VHI75004G553	AS	FE	N	B	IC (75004G553) [IC1] IC

10 Operation PWB

NO.	PARTS CODE	PRICE RANK		NEW MARK	PART RANK	DESCRIPTION
		Ex	Ja			
16	VHPGL9HY4//--1	A B	D C		B	LED (GL9HY4) [LED1] LED
17	VHPGL9EG4//--1	A C	D C		B	LED (GL9EG4) [LED2] LED
18	VHPGL9HY4//--1	A B	D C		B	LED (GL9HY4) [LED3] LED
19	VHPGL9EG4//--1	A C	D C		B	LED (GL9EG4) [LED4] LED
20	VRD-RC2EY220J	A A	D A		C	Resistor (1/4W 22Ω ±5%) [R1] テイコウ
21	VRD-RC2EY472J	A A	D A		C	Resistor (1/4W 4.7KΩ ±5%) [R2] テイコウ
22	VRD-RC2EY102J	A A	D A		C	Resistor (1/4W 1.0KΩ ±5%) [R3] テイコウ
23	VRD-RC2EY103J	A A	D A		C	Resistor (1/4W 10KΩ ±5%) [R4] テイコウ
24	VRD-RC2EY472J	A A	D A		C	Resistor (1/4W 4.7KΩ ±5%) [R5] テイコウ
25	VRD-RC2EY102J	A A	D A		C	Resistor (1/4W 1.0KΩ ±5%) [R6] テイコウ
26	VRD-RC2EY102J	A A	D A		C	Resistor (1/4W 1.0KΩ ±5%) [R7] テイコウ
27	VRD-RC2EY221J	A A	D A		C	Resistor (1/4W 220Ω ±5%) [R8] テイコウ
28	VRD-RC2EY221J	A A	D A		C	Resistor (1/4W 220Ω ±5%) [R9] テイコウ
29	VRD-RC2EY221J	A A	D A		C	Resistor (1/4W 220Ω ±5%) [R10] テイコウ
30	VRD-RC2EY221J	A A	D A		C	Resistor (1/4W 220Ω ±5%) [R11] テイコウ
31	VRD-RC2EY103J	A A	D A		C	Resistor (1/4W 10KΩ ±5%) [R12] テイコウ
32	VRD-RC2EY822J	A A	D A		C	Resistor (1/4W 8.2KΩ ±5%) [R13] テイコウ
33	VRD-RC2EY202J	A A	D A		C	Resistor (1/4W 2KΩ ±5%) [R14] テイコウ
34	VRD-RC2EY103J	A A	D A		C	Resistor (1/4W 10KΩ ±5%) [R15] テイコウ
35	VRD-RC2EY103J	A A	D A		C	Resistor (1/4W 10KΩ ±5%) [R16] テイコウ
36	VRD-RC2EY103J	A A	D A		C	Resistor (1/4W 10KΩ ±5%) [R17] テイコウ
37	VRD-RC2EY103J	A A	D A		C	Resistor (1/4W 10KΩ ±5%) [R18] テイコウ
38	VRD-RC2EY103J	A A	D A		C	Resistor (1/4W 10KΩ ±5%) [R19] テイコウ
39	QSW-P0335FCZZ	A B	D B	N	B	Push switch [S1] プッシュスイッチ
40	QSW-P0335FCZZ	A B	D B	N	B	Push switch [S2] プッシュスイッチ
41	QSW-P0335FCZZ	A B	D B	N	B	Push switch [S3] プッシュスイッチ
42	QSW-P0335FCZZ	A B	D B	N	B	Push switch [S4] プッシュスイッチ
43	QSW-P0335FCZZ	A B	D B	N	B	Push switch [S5] プッシュスイッチ
44	QSW-P0335FCZZ	A B	D B	N	B	Push switch [S6] プッシュスイッチ
45	QSW-P0335FCZZ	A B	D B	N	B	Push switch [S7] プッシュスイッチ
46	QSW-P0335FCZZ	A B	D B	N	B	Push switch [S8] プッシュスイッチ
47	VSJC501-P//--1	A B	D B		B	Transistor (JC501) [TR1] トランジスター
48	LPLTM3523FCZZ ユニット (Unit)	A B	D B	N	C	OPU earth plate S OPUアースパン S
901	CPWBF0776FC51	B K	H V	N	E	Operation PWB ソウサキバン

11 PCU PWB

NO.	PARTS CODE	PRICE RANK		NEW MARK	PART RANK	DESCRIPTION
		Ex	Ja			
1	VCKYTP1HF223Z	A A	D A		C	Capacitor (50WV 0.022μF) [C1] コンデンサー
2	VCCCTS1HH220J	A A	D A		C	Capacitor (22pF 50V) [C2] コンデンサー
3	VCCCTS1HH220J	A A	D A		C	Capacitor (22pF 50V) [C3] コンデンサー
4	VCKYTS1HR472K	A A	D A	N	C	Capacitor (50WV 4700PF) [C4] コンデンサー
5	VCKYTS1HR472K	A A	D A	N	C	Capacitor (50WV 4700PF) [C5] コンデンサー
6	VCKYTS1HR472K	A A	D A	N	C	Capacitor (50WV 4700PF) [C6] コンデンサー
7	VCKYTS1HR472K	A A	D A	N	C	Capacitor (50WV 4700PF) [C7] コンデンサー
8	VCKYTS1HR472K	A A	D A	N	C	Capacitor (50WV 4700PF) [C9] コンデンサー
9	VCKYTS1HR472K	A A	D A	N	C	Capacitor (50WV 4700PF) [C10] コンデンサー
10	VCKYTS1HR472K	A A	D A	N	C	Capacitor (50WV 4700PF) [C11] コンデンサー
11	VCKYTS1HR472K	A A	D A	N	C	Capacitor (50WV 4700PF) [C12] コンデンサー
12	VCKYTS1HR472K	A A	D A	N	C	Capacitor (50WV 4700PF) [C13] コンデンサー
13	VCKYTS1HR472K	A A	D A	N	C	Capacitor (50WV 4700PF) [C14] コンデンサー
14	VCKYTS1HR472K	A A	D A	N	C	Capacitor (50WV 4700PF) [C15] コンデンサー
15	VCKYTS1HR472K	A A	D A	N	C	Capacitor (50WV 4700PF) [C16] コンデンサー
16	VCKYTS1HR472K	A A	D A	N	C	Capacitor (50WV 4700PF) [C17] コンデンサー
17	VCKYTS1HR472K	A A	D A	N	C	Capacitor (50WV 4700PF) [C18] コンデンサー
18	VCKYTS1HR472K	A A	D A	N	C	Capacitor (50WV 4700PF) [C19] コンデンサー
19	VCKYTS1HR472K	A A	D A	N	C	Capacitor (50WV 4700PF) [C20] コンデンサー
20	VCCCTS1HH471J	A A	D A		C	Capacitor (50WV 470PF) [C23] コンデンサー
21	VCCCTS1HH471J	A A	D A		C	Capacitor (50WV 470PF) [C24] コンデンサー
22	VCCCTS1HH471J	A A	D A		C	Capacitor (50WV 470PF) [C26] コンデンサー
23	VCCCTS1HH471J	A A	D A		C	Capacitor (50WV 470PF) [C27] コンデンサー
24	VCCCTS1HH471J	A A	D A		C	Capacitor (50WV 470PF) [C29] コンデンサー
25	VCCCTS1HH471J	A A	D A		C	Capacitor (50WV 470PF) [C30] コンデンサー
26	VCKYTP1HF223Z	A A	D A		C	Capacitor (50WV 0.022μF) [C31] コンデンサー
27	VCKYTP1HF104Z	A A	D A		C	Capacitor (50WV 0.10μF) [C32] コンデンサー
28	VCEAEA1AW476M	A B	D B	N	C	Capacitor (10WV 47μF) [C33] コンデンサー
29	VCEAEA1AW476M	A B	D B	N	C	Capacitor (10WV 47μF) [C34] コンデンサー
30	VCEAEA1AW476M	A B	D B	N	C	Capacitor (10WV 47μF) [C35] コンデンサー
31	VCCCTS1HH471J	A A	D A		C	Capacitor (50WV 470PF) [C36] コンデンサー
32	VCCCTS1HH471J	A A	D A		C	Capacitor (50WV 470PF) [C37] コンデンサー
33	VCCCTS1HH471J	A A	D A		C	Capacitor (50WV 470PF) [C38] コンデンサー
34	VCCCTS1HH471J	A A	D A		C	Capacitor (50WV 470PF) [C39] コンデンサー
35	VCCCTS1HH471J	A A	D A		C	Capacitor (50WV 470PF) [C40] コンデンサー
36	QCNCM0340FCZZ	A C	D D	N	C	Connector (12pin) [CN11] コネクター
37	QCNCM0339FCZZ	A C	D D	N	C	Connector (15pin) [CN12] コネクター

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NO.	PARTS CODE	PRICE RANK		NEW MARK	PART RANK	DESCRIPTION
		Ex	Ja			
38	QCNCM0339FCZZ	AC	DD	N	C	Connector (15pin) [CN13] コネクター
39	QCNCM0542FCZZ	AC	DC	N	C	Connector (6pin) [CN14] コネクター
40	QCNCM0540FCZZ	AD	DF	N	C	Connector (14pin) [CN15] コネクター
41	QCNCM0541FCZZ	AD	DH	N	C	Connector (20pin) [CN17] コネクター
42	VHDDA204K//--1	AC	DC		B	Diode (DA204K) [D1-D2] ダイオード
43	VHDDA204K//--1	AC	DC		B	Diode (DA204K) [D3-D4] ダイオード
44	VHDDA204K//--1	AC	DC		B	Diode (DA204K) [D5-D6] ダイオード
45	VHDDA204K//--1	AC	DC		B	Diode (DA204K) [D7-D8] ダイオード
46	RFILN1004AC12	AC	DD		C	EMI filter (47pF) [FL1] EMI フィルター
47	RFILN1004AC13	AC	DD		C	EMI filter (100pF) [FL2] EMI フィルター
48	VH178P214GC//	BP	MC	N	B	IC (78P214GC) [IC1] IC
49	VH1LZ93M18///	AR	EZ		B	IC (LZ93M18) [IC2] IC
50	VH1S2444R///	AP	EP	N	B	IC (S2444R) [IC3] IC
51	VH1UPA2003C-1	AK	EC		B	IC (UPA2003C) [IC4] IC
52	VH1UPA2003C-1	AK	EC		B	IC (UPA2003C) [IC5] IC
53	VRS-TP2BD202J	AA	DA		C	Resistor (1/8W 2.0KΩ ±5%) [R1] ティコウ
54	VRS-TP2BD202J	AA	DA		C	Resistor (1/8W 2.0KΩ ±5%) [R2] ティコウ
55	VRS-TP2BD202J	AA	DA		C	Resistor (1/8W 2.0KΩ ±5%) [R3] ティコウ
56	VRS-TP2BD202J	AA	DA		C	Resistor (1/8W 2.0KΩ ±5%) [R4] ティコウ
57	VRS-TP2BD202J	AA	DA		C	Resistor (1/8W 2.0KΩ ±5%) [R5] ティコウ
58	VRS-TP2BD202J	AA	DA		C	Resistor (1/8W 2.0KΩ ±5%) [R6] ティコウ
59	VRS-TP2BD202J	AA	DA		C	Resistor (1/8W 2.0KΩ ±5%) [R7] ティコウ
60	VRS-TP2BD202J	AA	DA		C	Resistor (1/8W 2.0KΩ ±5%) [R8] ティコウ
61	VRS-TP2BD202J	AA	DA		C	Resistor (1/8W 2.0KΩ ±5%) [R9] ティコウ
62	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R10] ティコウ
63	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R11] ティコウ
64	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R12] ティコウ
65	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R13] ティコウ
66	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R14] ティコウ
67	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R15] ティコウ
68	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R16] ティコウ
69	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R17] ティコウ
70	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R18] ティコウ
71	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R19] ティコウ
72	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R20] ティコウ
73	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R21] ティコウ
74	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R22] ティコウ
75	VRS-TP2BD221J	AB	DB		C	Resistor (1/8W 220Ω ±5%) [R23] ティコウ
76	VRS-TP2BD331J	AB	DB		C	Resistor (1/8W 330Ω ±5%) [R24] ティコウ
77	VRS-TP2BD202J	AA	DA		C	Resistor (1/8W 2.0KΩ ±5%) [R25] ティコウ
78	VRS-TP2BD105J	AA	DA		C	Resistor (1/8W 1.0MΩ ±5%) [R26] ティコウ
79	VRS-TP2BD331J	AB	DB		C	Resistor (1/8W 330Ω ±5%) [R27] ティコウ
80	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R28] ティコウ
81	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R29] ティコウ
82	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R30] ティコウ
83	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R31] ティコウ
84	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R32] ティコウ
85	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R33] ティコウ
86	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R34] ティコウ
87	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R35] ティコウ
88	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R36] ティコウ
89	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R37] ティコウ
90	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R38] ティコウ
91	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R39] ティコウ
92	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R40] ティコウ
93	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R41] ティコウ
94	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R42] ティコウ
95	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R43] ティコウ
96	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R44] ティコウ
97	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R45] ティコウ
98	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R46] ティコウ
99	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R47] ティコウ
100	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R48] ティコウ
101	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R49] ティコウ
102	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R50] ティコウ
103	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R51] ティコウ
104	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R52] ティコウ
105	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R53] ティコウ
106	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R54] ティコウ
107	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R55] ティコウ
108	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R56] ティコウ
109	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R57] ティコウ
110	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R58] ティコウ
111	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R59] ティコウ
112	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R60] ティコウ
113	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R61] ティコウ
114	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R62] ティコウ
115	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R63] ティコウ
116	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R64] ティコウ
117	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R65] ティコウ

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NO.	PARTS CODE	PRICE RANK		NEW MARK	PART RANK	DESCRIPTION
		Ex	Ja			
118	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R66] テイコウ
119	VRS-TP2BD473J	AA	DA		C	Resistor (1/8W 47KΩ ±5%) [R67] テイコウ
120	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R68] テイコウ
121	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R69] テイコウ
122	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R70] テイコウ
123	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R71] テイコウ
124	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R72] テイコウ
125	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R73] テイコウ
126	VRS-TP2BD392F	AA	DA	N	C	Resistor (1/8W 3.9KΩ ±1%) [R74] テイコウ
127	VRS-TP2BD473J	AA	DA		C	Resistor (1/8W 47KΩ ±5%) [R76] テイコウ
128	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R77] テイコウ
129	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R78] テイコウ
130	VRS-TP2BD122J	AA	DA		C	Resistor (1/8W 1.2KΩ ±5%) [R79] テイコウ
131	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R81] テイコウ
132	VRS-TP2BD472J	AA	DA		C	Resistor (1/8W 4.7KΩ ±5%) [R82] テイコウ
133	VRS-TP2BD472J	AA	DA		C	Resistor (1/8W 4.7KΩ ±5%) [R83] テイコウ
134	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R84] テイコウ
135	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R85] テイコウ
136	VRS-TP2BD472J	AA	DA		C	Resistor (1/8W 4.7KΩ ±5%) [R86] テイコウ
137	VRS-TP2BD472J	AA	DA		C	Resistor (1/8W 4.7KΩ ±5%) [R87] テイコウ
138	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R88] テイコウ
139	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R89] テイコウ
140	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R90] テイコウ
141	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R91] テイコウ
142	VRS-TP2BD472J	AA	DA		C	Resistor (1/8W 4.7KΩ ±5%) [R92] テイコウ
143	VRS-TP2BD221J	AB	DB		C	Resistor (1/8W 220Ω ±5%) [R93] テイコウ
144	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R94] テイコウ
145	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R95] テイコウ
146	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R96] テイコウ
147	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R97] テイコウ
148	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0KΩ ±5%) [R98] テイコウ
149	VRS-TP2BD221J	AB	DB		C	Resistor (1/8W 220Ω ±5%) [R99] テイコウ
150	RCRSP1012HCZZ	AK	DZ		B	Crystal (11.0592MHz) [X1] クリスタル
ユニット (Unit)						
901	CPWBS0779FC51	BV	RL	N	E	PCU PWB PCU キパン

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NO.	PARTS CODE	PRICE RANK		NEW MARK	PART RANK	DESCRIPTION
		Ex	Ja			
1	RCRS-1014ACZZ	AU	FK		B	Crystal (16MHz) [1K] クリスタル
2	RCRSZ1009HCZZ	AR	EY		B	Crystal (66MHz) [1L] クリスタル
3	VHI68000-08-1	BF	HT		B	LSI,CPU (MC68000) [2A] IC
4	VHILZ93J16///	BB	GN		B	IC (LZ93J16) [2G] IC
5	VHIMC145406F1	AL	EF	N	B	IC (MC145406) [2L] IC
6	VHI74LS244F-1	AF	DP	N	B	IC (74LS244) [3G] IC
7	VHI74LS244F-1	AF	DP	N	B	IC (74LS244) [3H] IC
8	VHICF78057///	BB	GL	N	B	IC (CF78057) [3K] IC
9	VHISN74LS14NS	AL	EC		B	IC (SN74LS14F) [4A] IC
10	VHI74LS125AF1	AD	DG	N	B	IC (74LS125) [4B] IC
11	QSOCCZ2042SC32	AE	DK		C	IC socket (32pin) [4C] ICソケット
12	VHI2751204DFC	BB	GL	N	B	IC (2751204DFC) [4C] IC
13	QSOCCZ2042SC32	AE	DK		C	IC socket (32pin) [4D] ICソケット
14	VHI2751203DFC	BB	GL	N	B	IC (2751203DFC) [4D] IC
15	VHISN74S74/NS	AF	DN	N	B	IC (SN74S74) [5B] IC
16	VHILH2464-12C	AS	FD		B	IC (LH2464-12C) [5F] IC
17	VHIS2444R///	AP	EP	N	B	IC (S2444R) [5K] IC
18	VHISN74LS04NS	AF	DP		B	IC (SN74LS04) [6B] IC
19	VHI74LS245F-1	AF	DP	N	B	IC (74LS245) [6C] IC
20	VHI74LS245F-1	AF	DP	N	B	IC (74LS245) [6D] IC
21	VHILH2464-12C	AS	FD		B	IC (LH2464-12C) [6F] IC
22	VHIMC7805CT-1	AD	DG		B	IC (MC7805CT) [7A] IC
23	VHISN74LS157N	AK	ED		B	IC (SN74LS157N) [7C] IC
24	VHISN74LS157N	AK	ED		B	IC (SN74LS157N) [7D] IC
25	VHISN74LS157N	AK	ED		B	IC (SN74LS157N) [7E] IC
26	VHISN74LS157N	AK	ED		B	IC (SN74LS157N) [7F] IC
27	VHISN74LS157N	AK	ED		B	IC (SN74LS157N) [7G] IC
28	VHI514256AZ10	BK	HW		B	IC (514256AZ10) [7B-1] IC
29	VHI514256AZ10	BK	HW		B	IC (514256AZ10) [7B-2] IC
30	VHI514256AZ10	BK	HW		B	IC (514256AZ10) [7B-3] IC
31	VHI514256AZ10	BK	HW		B	IC (514256AZ10) [7B-4] IC
32	VHILH2307RL-1	AT	FG	N	B	IC (LH2307RL) [8F] IC
33	VHILH2307RJ-1	AT	FG	N	B	IC (LH2307RJ) [8G] IC
34	VHI74LS244F-1	AF	DP	N	B	IC (74LS244) [8J] IC
35	VHI74LS273F-1	AF	DP	N	B	IC (74LS273) [8K] IC
36	VHI74LS244F-1	AF	DP	N	B	IC (74LS244) [9J] IC
37	VCEAJA1CW226M	AB	DB		C	Capacitor (16WV 22μF) [C1] コンデンサー

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NO.	PARTS CODE	PRICE RANK		NEW MARK	PART RANK	DESCRIPTION
		Ex	Ja			
38	VCEAJA1CW226M	AB	DB		C	Capacitor (16WV 22 μ F) [C2] コンデンサー
39	VCEAEA0JW227M	AB	DB		C	Capacitor (6.3WV 220 μ F) [C3] コンデンサー
40	VCEAJA1CW106M	AB	DB		C	Capacitor (16WV 10 μ F) [C4] コンデンサー
41	VCEAJA1CW106M	AB	DB		C	Capacitor (16WV 10 μ F) [C5] コンデンサー
42	VCEAJA1CW106M	AB	DB		C	Capacitor (16WV 10 μ F) [C6] コンデンサー
43	VCEAJA1CW106M	AB	DB		C	Capacitor (16WV 10 μ F) [C7] コンデンサー
44	VCEAJA1CW226M	AB	DB		C	Capacitor (16WV 22 μ F) [C8] コンデンサー
45	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C9] コンデンサー
46	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C10] コンデンサー
47	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C11] コンデンサー
48	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C12] コンデンサー
49	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C13] コンデンサー
50	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C14] コンデンサー
51	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C15] コンデンサー
52	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C16] コンデンサー
53	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C17] コンデンサー
54	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C18] コンデンサー
55	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C19] コンデンサー
56	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C20] コンデンサー
57	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C21] コンデンサー
58	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C22] コンデンサー
59	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C23] コンデンサー
60	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C24] コンデンサー
61	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C25] コンデンサー
62	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C26] コンデンサー
63	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C27] コンデンサー
64	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C28] コンデンサー
65	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C29] コンデンサー
66	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C30] コンデンサー
67	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C31] コンデンサー
68	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C32] コンデンサー
69	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C33] コンデンサー
70	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C34] コンデンサー
71	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C35] コンデンサー
72	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C36] コンデンサー
73	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C37] コンデンサー
74	VCKYTS1HR561K	AA	DA	N	C	Capacitor (50WV 560PF) [C38] コンデンサー
75	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C39] コンデンサー
76	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C40] コンデンサー
77	VCCCTS1HH330J	AA	DA		C	Capacitor (50WV 33PF) [C41] コンデンサー
78	VCCCTS1HH101J	AA	DA		C	Capacitor (50WV 100PF) [C42] コンデンサー
79	VCKYTS1HR102K	AA	DA	N	C	Capacitor (50WV 1000PF) [C43] コンデンサー
80	VCCCTS1HH330J	AA	DA		C	Capacitor (50WV 33PF) [C44] コンデンサー
81	VCCCTS1HH101J	AA	DA		C	Capacitor (50WV 100PF) [C45] コンデンサー
82	VCCCTS1HH101J	AA	DA		C	Capacitor (50WV 100PF) [C46] コンデンサー
83	VCCCTS1HH101J	AA	DA		C	Capacitor (50WV 100PF) [C47] コンデンサー
84	VCCCTS1HH101J	AA	DA		C	Capacitor (50WV 100PF) [C48] コンデンサー
85	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C49] コンデンサー
86	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C50] コンデンサー
87	VCKYTP1HF104Z	AA	DA		C	Capacitor (50WV 0.10 μ F) [C51] コンデンサー
88	VCCSPUIHL101J	AA	DA		C	Capacitor (50WV 100PF) [C52] コンデンサー
89	QCNCW0341FCZ2	AG	DU	N	C	Connector [CN51] コネクター
90	QCNCM1039HC6J	AY	GA		C	Connector (60pin) [CN52] コネクター
91	QCNCM1039HC6J	AY	GA		C	Connector (60pin) [CN53] コネクター
92	QCNCM0342FCZ2	AW	FP	N	C	Connector [CN54] コネクター
93	QCNCW1039ACZ2	AN	FF		C	Connector (36pin) [CN55] コネクター
94	QCNCW0343FCZ2	AK	EA	N	C	Connector [CN56] コネクター
95	VHDRLS73///-1	AA	DA		B	Diode (RLS73) [D1] ダイオード
96	VHDRLS73///-1	AA	DA		B	Diode (RLS73) [D2] ダイオード
97	RCILZ1003AC01	AA	DA		C	Coil [FB1] コイル
98	QCNCM0042FCZ2	AB	DB		B	Connector (2pin) [J3] コネクター
99	VRS-TP2BD222J	AA	DA		C	Resistor (1/8W 2.2K Ω $\pm$ 5%) [R1] ティコウ
100	VRS-TP2BD101J	AA	DA		C	Resistor (1/8W 100 Ω $\pm$ 5%) [R2] ティコウ
101	VRS-TP2BD222J	AA	DA		C	Resistor (1/8W 2.2K Ω $\pm$ 5%) [R3] ティコウ
102	VRS-TP2BD101J	AA	DA		C	Resistor (1/8W 100 Ω $\pm$ 5%) [R4] ティコウ
103	VRS-TP2BD561J	AA	DA		C	Resistor (1/8W 560 Ω $\pm$ 5%) [R5] ティコウ
104	VRS-TP2BD561J	AA	DA		C	Resistor (1/8W 560 Ω $\pm$ 5%) [R6] ティコウ
105	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 1.0K Ω $\pm$ 5%) [R7] ティコウ
106	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10K Ω $\pm$ 5%) [R8] ティコウ
107	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R9] ティコウ
108	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10K Ω $\pm$ 5%) [R10] ティコウ
109	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10K Ω $\pm$ 5%) [R11] ティコウ
110	VRS-TP2BD561J	AA	DA		C	Resistor (1/8W 560 Ω $\pm$ 5%) [R12] ティコウ
111	VRS-TP2BD561J	AA	DA		C	Resistor (1/8W 560 Ω $\pm$ 5%) [R13] ティコウ
112	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R14] ティコウ
113	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R15] ティコウ
114	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R16] ティコウ
115	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R17] ティコウ
116	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R18] ティコウ
117	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R19] ティコウ

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NO.	PARTS CODE	PRICE Ex	RANK Ja	NEW MARK	PART RANK	DESCRIPTION
118	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R20] テイコウ
119	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R21] テイコウ
120	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R22] テイコウ
121	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R23] テイコウ
122	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R24] テイコウ
123	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R25] テイコウ
124	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R26] テイコウ
125	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R27] テイコウ
126	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R28] テイコウ
127	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R29] テイコウ
128	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R30] テイコウ
129	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R31] テイコウ
130	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R32] テイコウ
131	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R33] テイコウ
132	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R34] テイコウ
133	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R35] テイコウ
134	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R36] テイコウ
135	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R37] テイコウ
136	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R38] テイコウ
137	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R39] テイコウ
138	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R40] テイコウ
139	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R41] テイコウ
140	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R42] テイコウ
141	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R43] テイコウ
142	VRS-TP2BD220J	AA	DA		C	Resistor (1/8W 22Ω ±5%) [R44] テイコウ
143	VRS-TP2BD102J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R45] テイコウ
144	VRS-TP2BD561J	AA	DA		C	Resistor (1/8W 560Ω ±5%) [R46] テイコウ
145	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R47] テイコウ
146	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R48] テイコウ
147	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R49] テイコウ
148	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R50] テイコウ
149	VRS-TP2BD101J	AA	DA		C	Resistor (1/8W 100Ω ±5%) [R51] テイコウ
150	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R52] テイコウ
151	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R53] テイコウ
152	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R54] テイコウ
153	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R55] テイコウ
154	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R56] テイコウ
155	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R57] テイコウ
156	VRS-TP2BD103J	AA	DA		C	Resistor (1/8W 10KΩ ±5%) [R58] テイコウ
157	VRS-TP2BD101J	AA	DA		C	Resistor (1/8W 100Ω ±5%) [R59] テイコウ
158	VRS-TP2BD332J	AA	DA		C	Resistor (1/8W 3.3KΩ ±5%) [R60] テイコウ
159	RMPTC8222QCKB	AD	DH		B	Block resistor (2.2KΩ×8 1/8W ±10%) [RM1] ブロックテイコウ
160	RMPTC8222QCKB	AD	DH		B	Block resistor (2.2KΩ×8 1/8W ±10%) [RM2] ブロックテイコウ
161	RMPTC8153QCKB	AD	DH		B	Block resistor (15KΩ×8 1/8W ±10%) [RM3] ブロックテイコウ
162	RMPTC8223QCKB	AD	DH		B	Block resistor (22KΩ×8 1/8W ±10%) [RM4] ブロックテイコウ
163	RMPTC8153QCKB	AD	DH		B	Block resistor (15KΩ×8 1/8W ±10%) [RM5] ブロックテイコウ
164	RMPTC8223QCKB	AD	DH		B	Block resistor (22KΩ×8 1/8W ±10%) [RM6] ブロックテイコウ
165	RMPTC8223QCKB	AD	DH		B	Block resistor (22KΩ×8 1/8W ±10%) [RM7] ブロックテイコウ
166	RMPTC8153QCKB	AD	DH		B	Block resistor (15KΩ×8 1/8W ±10%) [RM8] ブロックテイコウ
167	RMPTC8153QCKB	AD	DH		B	Block resistor (15KΩ×8 1/8W ±10%) [RM9] ブロックテイコウ
168	RMPTC8223QCKB	AD	DH		B	Block resistor (22KΩ×8 1/8W ±10%) [RM10] ブロックテイコウ
169	RMPTC8223QCKB	AD	DH		B	Block resistor (22KΩ×8 1/8W ±10%) [RM11] ブロックテイコウ
170	RMPTC8153QCKB	AD	DH		B	Block resistor (15KΩ×8 1/8W ±10%) [RM12] ブロックテイコウ
171	RMPTC8222QCKB	AD	DH		B	Block resistor (2.2KΩ×8 1/8W ±10%) [RM13] ブロックテイコウ
172	RMPTC8222QCKB	AD	DH		B	Block resistor (2.2KΩ×8 1/8W ±10%) [RM14] ブロックテイコウ
173	RMPTC8222QCKB	AD	DH		B	Block resistor (2.2KΩ×8 1/8W ±10%) [RM15] ブロックテイコウ
174	RMPTC8222QCKB	AD	DH		B	Block resistor (2.2KΩ×8 1/8W ±10%) [RM16] ブロックテイコウ
175	RMPTC8153QCKB	AD	DH		B	Block resistor (15KΩ×8 1/8W ±10%) [RM17] ブロックテイコウ
176	RMPTC8223QCKB	AD	DH		B	Block resistor (22KΩ×8 1/8W ±10%) [RM18] ブロックテイコウ
177	RMPTC8153QCKB	AD	DH		B	Block resistor (15KΩ×8 1/8W ±10%) [RM19] ブロックテイコウ
178	RMPTC8223QCKB	AD	DH		B	Block resistor (22KΩ×8 1/8W ±10%) [RM20] ブロックテイコウ
179	RMPTC8102QCKB	AD	DH		B	Block resistor (1.0KΩ×8 1/8W ±10%) [RM21] ブロックテイコウ
180	RMPTC8102QCKB	AD	DH		B	Block resistor (1.0KΩ×8 1/8W ±10%) [RM22] ブロックテイコウ
181	VSJC501-P/-1	AB	DB		B	Transistor (JC501) [TR1] トランジスター
182	VS2SA673A/-1	AD	DH		B	Transistor (2SA673A) [TR2] トランジスター
183	HPNLC0186FCZZ	AM	EF	N	C	I/F panel I/Fパネル
184	QEARP0038FCZZ	AB	DB	N	C	Earth plate B アースパン B
185	PGIDM1067FCZZ	AF	DP	N	C	W card guide for CN52 Wカードガイド
186	PGIDM1068FCZZ	AG	DS	N	C	EXM guide for CN54 EXMガイド
187	XBPSD20P16000	AA	DA		C	Screw for CN54 (2×16) ビス
188	XBPSD30P16KS0	AA	DA		C	Screw for CN52,53 (3×16KS) ビス
189	XEPSD30P06000	AA	DA		C	Screw for CN54 (3×6) ビス(Pタイト)
190	XNESD20-16000	AA	DA		C	Nut for CN54 (2mm) ナット
191	XNESD30-24000	AA	DA		C	Nut for CN52,53 (3NS) ナット
192	XWSSD20-05000	AA	DA		C	Washer for CN54 (M2) ワッシャ
	ユニット (Unit)					
901	CPWBN0735FC51	CN	VG	N	E	ICU PWB ICU キパン

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PARTS CODE	NO.	PRICE R.		NEW	P/R	
		Ex.	Ja.			
【C】						
CB0X-0065FC01	4- 22	AW	F S	N	C	
CB0X-0067FC01	9- 3	AK	E A	N	C	
CCAB-0629FC01	1- 4	AT	F F	N	D	
CCAB-0631FC31	1- 9	AS	F A	N	D	
CCASZ0184FC31	5-101	AP	E Q	N	C	
CC0VP0947FC51	4- 14	AN	E L	N	C	
CC0VP0948FC31	3- 14	AR	E Y	N	C	
CC0VQ0907FC02	7- 7	AP	E N	N	C	
CDAIU0359FC01	3- 13	AW	F S	N	C	
CDTCT0075FC01	7- 8	AR	E W	N	E	
CDTCT0078FC01	6- 13	AM	E E	N	E	
CFRM-0548FC01	4- 42	AW	F S	N	C	
CFRM-0552FC01	3- 61	AR	E Z	N	C	
CFRM-0553FC01	6- 5	AU	F J	N	C	
CGIDH1057FC01	3- 38	AN	E H	N	C	
CGIDH1058FC01	3- 33	AM	E D	N	C	
CGIDH1059FC01	5- 10	AQ	E U	N	C	
CGIDH1059FC31	2- 10	BN	L R	N	E	
//	5- 901	BN	L R	N	E	
CGIDM1064FC31	2- 9	AS	F C	N	C	
CHLDZ0919FC51	4- 67	AK	D X	N	C	
CM0TN0565FC31	4- 61	BF	H H	N	B	
CPLTM3033FC01	4- 31	AR	E Z	N	C	
CPLTM3193FC01	4- 57	AL	E C	N	C	
CPLTM3215FC01	6- 21	AF	D P	N	C	
CPLTM3216FC01	6- 16	AF	D P	N	C	
CPWBF0771FC31	2- 4	BT	N V	N	E	
CPWBF0771FC32	2- 4	BU	N Z	N	E	
CPWBF0771FC33	2- 4	BT	N V	N	E	
CPWBF0772FC31	4- 16	BL	L B	N	E	
CPWBF0773FC31	4- 23	AW	F R	N	E	
CPWBF0774FC31	4- 18	BM	L L	N	E	
CPWBF0776FC51	1- 5	BK	H V	N	E	
//	10- 901	BK	H V	N	E	
CPWBF0778FC31	5- 43	AY	F Z	N	E	
CPWBF0806FC31	3- 12	AS	F C	N	E	
CPWBF0806FC32	3- 12	AS	F B	N	E	
CPWBN0735FC51	4- 502	CN	V G	N	E	
//	12- 901	CN	V G	N	E	
CPWBS0779FC51	4- 501	BV	R L	N	E	
//	11- 901	BV	R L	N	E	
CS0U-0078FC01	6- 1	AK	D Z	N	C	
CSPRB1502FC31	2- 7	AW	F R	N	C	
//	4- 1	AW	F R	N	C	
CTHM-0011FC01	7- 10	AK	D Y	N	C	
【D】						
DHAI-1605FCZZ	7- 11	AC	D D	N	C	
DHAI-1606FCZZ	7- 9	AC	D C	N	C	
DHAI-1609FCZZ	2- 8	AF	D P	N	C	
//	10- 9	AF	D P	N	C	
DHAI-1611FCZZ	10- 11	AB	D C	N	C	
DHAI-1612FCZZ	4- 68	AS	F F	N	C	
DHAI-1626FCZZ	7- 4	AA	D A	N	C	
DHAI-1627FCZZ	10- 10	AM	E F	N	C	
DHAI-1675FCZZ	1- 11	AB	D B	N	C	
//	3- 51	AB	D B	N	C	
DHAI-1676FCZZ	3- 49	AG	D R	N	C	
DHAI-1677FCZZ	3- 49	AG	D S	N	C	
DHAI-1678FCZZ	3- 50	AD	D H	N	C	
DHAI-1732FCZZ	3- 65	AD	D F	N	C	
DHAI-1733FCZZ	3- 65	AD	D F	N	C	
DUNT-6240FCZZ	3- 1	CD	U H	N	E	
DUNTW6244FC11	2- 3	BN	L R	N	E	
//	7- 901	BN	L R	N	E	
DUNTW6244FC13	2- 3	BN	L R	N	E	
//	7- 901	BN	L R	N	E	
DUNTW6244FC14	2- 3	BN	L R	N	E	
//	7- 901	BN	L R	N	E	
DUNTW6244FC15	2- 3	BN	L R	N	E	
//	7- 901	BN	L R	N	E	
【G】						
GCAB-0630FCZZ	1- 2	AV	F L	N	D	
GCAB-0632FCZZ	1- 3	AQ	E T	N	D	
GCASP0145FCZZ	8- 11	AQ	E V	N	D	
GC0VH0187FCZZ	1- 10	AC	D E	N	C	
GLEGG0040FCZZ	4- 17	AB	D B	N	C	
【H】						
HINDP0270FCZZ	1- 7	AK	D X	N	C	
HPNLC0185FCZZ	1- 6	AF	D M	N	C	

PARTS CODE	NO.	PRICE R.		NEW	P/R	
		Ex.	Ja.			
HPNLC0186FCZZ	12- 183	AM	E F	N	C	
[L]						
LBNDJ2003SCZZ	4- 74	AA	DA		C	
LBNDJ5003BCZZ	4- 69	AA	DA		C	
LB0SZ1031FCZZ	5- 35	AC	DE		C	
LBSHC0095FCZZ	4- 72	AB	DB		C	
LDAIU0358FCZZ	4- 24	AT	FH	N	C	
LDAIU0361FCZZ	8- 8	AB	DB	N	C	
LFIX-0336FCZ1	3- 20	AD	DG	N	C	
LFIX-0384FCZZ	3- 67	AE	DK	N	C	
LFIX-0385FCZZ	3- 68	AG	DT	N	C	
LFRM-0550FCZZ	4- 27	AR	FA	N	C	
LFRM-0551FCZZ	3- 46	AR	EX	N	C	
LHLDZ0120SCZZ	4- 75	AA	DA		C	
LHLDW0595FCZZ	4- 76	AC	DC		C	
LHLDW0734FCZZ	2- 11	AA	DA		C	
//	3- 48	AA	DA		C	
//	4- 10	AA	DA		C	
LHLDW1006FCZZ	3- 71	AA	DA	N	C	
LHLDW1009ACZZ	3- 42	AA	DA		C	
LHLDW1098HCZZ	1- 20	AB	DC		C	
LHLDZ0917FCZ1	4- 56	AE	DK	N	C	
LHLDZ0918FCZZ	4- 5	AE	DJ	N	C	
LHLDZ0920FCZZ	7- 5	AK	DY	N	C	
//	9- 1	AK	DY	N	C	
LHLDZ0948FCZZ	3- 10	AB	DC	N	C	
LPINS0133FCZZ	5- 18	AA	DA	N	C	
LPINS0217FCZZ	6- 39	AB	DC	N	C	
LPLTM3034FCZZ	3- 30	AB	DC	N	C	
LPLTM3036FCZZ	8- 2	AN	EG	N	C	
LPLTM3039FCZZ	7- 24	AK	EA	N	C	
LPLTM3040FCZZ	7- 23	AD	DH	N	C	
LPLTM3229FCZZ	3- 8	AD	DF	N	C	
LPLTM3437FCZZ	3- 54	A F	DN	N	C	
LPLTM3520FCZZ	3- 66	AG	DR	N	C	
LPLTM3523FCZZ	10- 48	AB	DB	N	C	
LPLTM3525FCZZ	5- 49	AB	DB	N	C	
LPLTM3543FCZZ	8- 14	AD	DG	N	C	
LPLTP3035FCZZ	8- 6	A F	DN	N	C	
LPLTP3037FCZZ	8- 3	AC	DD	N	C	
LS0U-0077FCZZ	1- 1	AH	DX	N	C	
LS0U-0079FCZZ	6- 4	AE	DL	N	C	
LSTPP0116FCZZ	7- 19	AA	DA		C	
LSTPP0161FCZZ	8- 4	AB	DC		C	
LSTPP0209FCZZ	3- 39	AB	DB	N	C	
LX-BZ0344FCZZ	2- 2	AA	DA		C	
//	5- 8	AA	DA		C	
LX-BZ0375FCZZ	1- 17	AA	DA		C	
LX-BZ0376FCZZ	2- 1	AA	DA		C	
//	3- 25	AA	DA		C	
LX-BZ0487FCZZ	7- 21	AA	DA		C	
LX-BZ0494FCZZ	3- 43	AB	DC		C	
LX-RZ1044HCZZ	4- 52	AA	DA		C	
LX-WZ0269FCZZ	5- 51	AC	DC	N	C	
LX-WZ1003HCZZ	5- 52	AA	DA		C	
LX-WZ2019SCZZ	5- 13	AA	DA		C	
LX-WZ5002BCZZ	4- 40	AA	DA		C	
LX-WZ5018BCZZ	5- 13	AA	DA		C	
//	6- 40	AA	DA		C	
LX-WZ5028BCZZ	5- 13	AA	DA		C	
[M]	-					
MLEVF0469FCZZ	7- 28	AD	DH	N	C	
MLEVF0494FCZZ	7- 16	AD	DH	N	C	
MLEVF0527FCZZ	3- 63	AB	DC	N	C	
MLEVP0465FCZZ	4- 37	AC	DD	N	C	
MLEVP0466FCZZ	5- 22	AD	DF	N	C	
MLEVP0467FCZZ	5- 15	AC	DD	N	C	
MSPRC1145FCZZ	8- 5	AA	DA		C	
MSPRC1496FCZZ	4- 36	AA	DA	N	C	
MSPRC1498FCZZ	3- 22	AA	DA	N	C	
MSPRC1499FCZZ	3- 41	AA	DA	N	C	
MSPRC1505FCZZ	8- 9	AC	DC	N	C	
MSPRC1506FCZZ	5- 3	AA	DA	N	C	
MSPRC1509FCZZ	6- 9	AA	DA	N	C	
MSPRC1511FCZZ	7- 22	AA	DA	N	C	
MSPRC1512FCZZ	7- 13	AA	DA	N	C	
MSPRC1580FCZZ	5- 33	AD	DH	N	C	
MSPRC1581FCZZ	7- 15	AB	DC	N	C	
MSPRC1595FCZZ	6- 17	AA	DA	N	C	
MSPRC1695FCZZ	5- 24	AB	DB	N	C	

PARTS CODE	NO.	PRICE R.		NEW	P/R
		Ex.	Ja.		
MSPRC1702FCZZ	6- 33	AA	DA	N	C
MSPRC1711FCZZ	6- 37	AA	DA	N	C
MSPRC1712FCZZ	6- 38	AA	DA	N	C
MSPRC1713FCZZ	6- 36	AB	DB	N	C
MSPRP1497FCZZ	4- 32	AD	DF	N	C
MSPRP1510FCZZ	7- 1	AD	DF	N	C
MSPRP1592FCZZ	4- 30	AD	DF	N	C
MSPRT1503FCZ1	3- 31	AA	DA	N	C
MSPRT1603FCZZ	6- 25	AC	DC	N	C
MSPRT1604FCZZ	6- 12	AC	DD	N	C
MSPRT1708FCZZ	3- 37	AA	DA	N	C
MSPRT1709FCZZ	3- 69	AA	DA	N	C
MSPRT1710FCZZ	4- 33	AA	DA		C
[N]					
NBLTH0117FCZZ	4- 62	AD	DG	N	C
NBLTH0118FCZZ	4- 50	AD	DF	N	C
NBLTK2052SCZZ	6- 25	AE	DM		C
NBRGC0311FCZZ	5- 26	AC	DE		C
NBRGC0343FCZZ	6- 24	AB	DB	N	C
NBRGP0259FCZZ	7- 18	AE	DK		C
NBRGP0266FCZZ	5- 12	AA	DA		C
NBRGP0331FCZ1	7- 25	AD	DG	N	C
NBRGP0386FCZZ	7- 31	AK	DX	N	C
NFANP0027FCZZ	3- 45	AW	FR	N	C
NGERH0401FCZZ	7- 30	AC	DD		C
NGERH0589FCZZ	4- 63	AC	DE	N	C
NGERH0590FCZZ	4- 45	AD	DF	N	C
NGERH0591FCZZ	4- 46	AD	DF	N	C
NGERH0592FCZZ	4- 49	AC	DD	N	C
NGERH0593FCZ1	4- 58	AB	DC	N	C
NGERH0594FCZZ	4- 43	AC	DE	N	C
NGERH0595FCZZ	4- 41	AC	DC	N	C
NGERH0596FCZZ	4- 59	AD	DG	N	C
NGERH0597FCZZ	4- 48	AC	DE	N	C
NGERH0598FCZZ	4- 51	AB	DC	N	C
NGERH0599FCZZ	4- 64	AB	DB	N	C
NGERH0600FCZZ	5- 27	AB	DC	N	C
NGERH0601FCZZ	5- 29	AB	DB	N	C
NGERH0602FCZZ	5- 32	AF	DM	N	C
NGERH0603FCZZ	5- 31	AB	DC	N	C
NGERH0604FCZZ	5- 48	AE	DK	N	C
NGERH0606FCZZ	4- 53	AC	DC	N	C
NGERH0638FCZZ	6- 29	AB	DB	N	C
NPLYZ0173FCZZ	6- 27	AC	DE	N	C
NPLYZ0174FCZZ	4- 66	AB	DC	N	C
NPLYZ0182FCZZ	6- 23	AB	DB	N	C
NRÖL10692FCZ1	7- 26	AV	FN	N	C
NRÖLP0529FCZZ	6- 8	AA	DA		C
NRÖLP0591FCZZ	4- 34	AA	DA		C
#					
	6- 20	AA	DA		C
NRÖLP0686FCZ1	3- 36	AB	DC	N	C
NRÖLP0687FCZZ	5- 16	AS	FB	N	C
NRÖLP0688FCZZ	5- 17	AP	EP	N	C
NRÖLP0689FCZZ	5- 14	AN	EJ	N	C
NRÖLP0690FCZZ	6- 14	AM	EF	N	C
NRÖLP0691FCZZ	6- 30	AM	EF	N	C
NRÖLP0729FCZZ	4- 29	AB	DB	N	C
NRÖLT0693FCZZ	7- 27	AW	FT	N	C
NSFTZ1205FCZ1	3- 35	AF	DN	N	C
NSFTZ1480FCZZ	3- 56	AB	DC	N	C
[P]					
PBRSR0098FCZZ	6- 2	AF	DP	N	C
PCAPH0032FCZZ	4- 79	AC	DE	N	C
PCAPH0033FCZZ	1- 18	AC	DE	N	C
PCAPH1001ACZZ	4- 77	AE	DL		C
PCAPH1003ACZZ	4- 78	AC	DK		C
PCASZ0184FCZZ	5- 6	AF	DP	N	C
PCASZ0185FCZZ	5- 9	AG	DS	N	C
PCÖVH0940FCZZ	2- 6	AG	DU	N	C
PCÖVP0946FCZ1	7- 3	AF	DQ	N	C
PCÖVP0970FCZZ	4- 73	AF	DP	N	C
PCÖVP0979FCZZ	3- 73	AC	DD	N	C
PFILZ0136FCZ1	3- 47	AK	DY	N	C
PGIDH1060FCZZ	5- 21	AG	DS	N	C
PGIDH1062FCZZ	5- 23	AG	DS	N	C
PGIDM1055FCZZ	3- 40	AC	DE	N	C
PGIDM1056FCZ1	3- 27	AD	DF	N	C
PGIDM1061FCZZ	5- 20	AG	DT	N	C
PGIDM1063FCZZ	5- 4	AE	DK	N	C
PGIDM1065FCZZ	6- 10	AH	DW	N	C

PARTS CODE	NO.	PRICE R.		NEW	P/R
		Ex.	Ja.		
PGIDM1066FCZZ	6- 18	AG	DS	N	C
PGIDM1067FCZZ	12- 185	AF	DP	N	C
PGIDM1068FCZZ	12- 186	AG	DS	N	C
PGIDM1126FCZZ	6- 19	AH	DV	N	C
PHOG-1009HCZZ	3- 60	AA	DA		C
PHOG-1023CCZZ	9- 6	AB	DB		C
PHOG-2062SCZZ	4- 70	AC	DC		C
PMAG-0021FCZZ	6- 7	AF	DM		C
PMLT-0791FCZZ	3- 70	AD	DB	N	C
PMLT-0796FCZZ	3- 72	AC	DC	N	C
PMLT-0797FCZZ	1- 19	AC	DC	N	C
PPIPP0108FCZ1	5- 47	AB	DC		C
PPIPP0121FCZZ	5- 34	AC	DC	N	C
PRNGP0025FCZZ	4- 39	AA	DA		C
//	5- 11	AA	DA		C
//	6- 28	AA	DA		C
PSHEP2299FCZZ	3- 34	AB	DB	N	C
PSHEP2350FCZZ	5- 50	AB	DB	N	C
PSHEP2442FCZZ	6- 31	AB	DB	N	C
PSHEP2443FCZZ	3- 53	AB	DB	N	C
PSHEP2535FCZZ	4- 85	AC	DE	N	C
PSHEP2555FCZZ	5- 44	AE	DL	N	C
PSHEP2561FCZZ	3- 74	AC	DE	N	C
PSHEP2565FCZZ	4- 81	AD	DG	N	C
PSHEP2566FCZZ	4- 80	AD	DF	N	C
PSHEP2568FCZZ	6- 34	AB	DB	N	C
PSHEP2569FCZZ	6- 35	AB	DC	N	C
PSHEP2581FCZZ	4- 82	AF	DM	N	C
PSHEP2582FCZZ	4- 83	AD	DG	N	C
PSHEP2597FCZZ	4- 84	AB	DC	N	C
PSHEZ1606FCZZ	8- 1	AB	DB		C
PSHEZ2450FCZZ	5- 5	AH	DX	N	C
PSPAK2331RCZZ	4- 11	AA	DB		C
PSPAN1007ACZZ	3- 28	AB	DB		C
PSPAZ0529FCZZ	1- 21	AC	DE	N	C
PTME-0188FCZZ	4- 38	AL	EC	N	C
PTME-0189FCZZ	8- 7	AF	DP	N	C
PTME-0190FCZZ	8- 10	AE	DJ	N	C
PTME-0191FCZZ	7- 12	AF	DP	N	C
PTUBG0089FCZZ	7- 32	AA	DA	N	C
{ Q }					
QACCB7521QCZZ	9- 6	AS	EZ	N	B
QACCB7620QCN1	9- 6	AX	FW		B
QACCD6611QCZZ	9- 6	AW	FQ	N	B
QACCD7613QCN5	9- 6	AQ	EV		B
QACCF7620QCZZ	9- 6	AX	FU		B
QACCCJ9610QCZZ	9- 6	AR	EW		B
QACCL7620QCZZ	9- 6	AW	FK		B
QACCV6620QCZZ	9- 6	AV	FN		B
QCNCM0042FCZZ	12- 98	AB	DB		B
QCNCM0333FCZZ	7- 20	AD	DF	N	C
QCNCM0339FCZZ	11- 37	AC	DD	N	C
//	11- 38	AC	DD	N	C
QCNCM0340FCZZ	11- 36	AC	DD	N	C
QCNCM0342FCZZ	12- 92	AW	FP	N	C
QCNCM0538FCZZ	5- 39	AC	DD	N	C
QCNCM0540FCZZ	11- 40	AD	DF	N	C
QCNCM0541FCZZ	11- 41	AD	DH	N	C
QCNCM0542FCZZ	11- 39	AC	DC	N	C
QCNCM1039HC6J	12- 90	AY	GA		C
//	12- 91	AY	GA		C
QCNCW0341FCZZ	12- 89	AG	DU	N	C
QCNCW0343FCZZ	12- 94	AK	EA	N	C
QCNCW1039ACZZ	12- 93	AN	FF		C
QCNW-0122FCZZ	9- 6	AR	EW		C
QCNW-0132FCZZ	9- 6	AV	FN		B
QEARP0036FCZZ	4- 55	AC	DC	N	C
QEARP0038FCZZ	12- 184	AB	DB	N	C
QPLGA0002QCZZ	9- 6	AN	EH		C
QPLGA0018WRE0	9- 6	AN	EG		C
QSLP-0127FCZ1	3- 11	AC	DD	N	C
QSOCZ2042SC32	12- 11	AE	DK		C
//	12- 13	AE	DK		C
QSW-M0395FCZZ	3- 7	AG	DS	N	B
QSW-M0396FCZZ	3- 7	AK	DY	N	B
QSW-M0400FCZZ	3- 64	AG	DS	N	B
QSW-P0335FCZZ	10- 39	AB	DB	N	B
//	10- 40	AB	DB	N	B
//	10- 41	AB	DB	N	B
//	10- 42	AB	DB	N	B

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PARTS CODE	NO.	PRICE R.		NEW	P/R	
		Ex.	Ja.			
QSW-P0335FCZZ	10- 43	AB	DB	N	B	
//	10- 44	AB	DB	N	B	
//	10- 45	AB	DB	N	B	
//	10- 46	AB	DB	N	B	
QSW-Z0388FCZZ	3- 32	AQ	ET	N	B	
QTANP0096FCZZ	9- 6	AA	DA		C	
【R】						
RALMB0002FCZZ	10- 1	AG	DS	N	B	
RC-K1E104ACZZ	1- 16	AA	DA		C	
RCILZ1003AC01	12- 97	AA	DA		C	
RCRM-1011CCZZ	10- 12	AD	DG		B	
RCRS-1014ACZZ	12- 1	AU	FK		B	
RCRSP1012HCZZ	11- 150	AK	DZ		B	
RCRSZ1009HCZZ	12- 2	AR	EY		B	
RFILN1004AC12	11- 46	AC	DD		C	
RFILN1004AC13	11- 47	AC	DD		C	
RLMPU0405FCZZ	7- 29	AX	FV		B	
RLMPU0406FCZZ	7- 29	AX	FV		B	
RLMPU0407FCZZ	7- 29	AX	FV		B	
RLMPU0408FCZZ	7- 29	AX	FV		B	
RMPTC8102QCKB	12- 179	AD	DH		B	
//	12- 180	AD	DH		B	
RMPTC8153QCKB	12- 161	AD	DH		B	
//	12- 163	AD	DH		B	
//	12- 166	AD	DH		B	
//	12- 167	AD	DH		B	
//	12- 170	AD	DH		B	
//	12- 175	AD	DH		B	
//	12- 177	AD	DH		B	
RMPTC8222QCKB	12- 159	AD	DH		B	
//	12- 160	AD	DH		B	
//	12- 171	AD	DH		B	
//	12- 172	AD	DH		B	
//	12- 173	AD	DH		B	
//	12- 174	AD	DH		B	
RMPTC8223QCKB	12- 162	AD	DH		B	
//	12- 164	AD	DH		B	
//	12- 165	AD	DH		B	
//	12- 168	AD	DH		B	
//	12- 169	AD	DH		B	
//	12- 176	AD	DH		B	
//	12- 178	AD	DH		B	
RPLU-0229FCZZ	5- 36	AN	EG	N	B	
RPLU-0230FCZZ	5- 45	AP	EL	N	B	
【S】						
SPAKA3823FCZZ	9- 2	AQ	ET	N	D	
SPAKA3824FCZZ	9- 4	AN	EH	N	D	
SPAKA4091FCZZ	9- 16	AB	DB	N	D	
SPAKA4103FCZZ	9- 104	AD	DG	N	D	
SPAKC3826FCZZ	9- 5	AP	EQ	N	D	
SSAKA0002FCZZ	9- 12	AA	DA		D	
SSAKA2011KCZZ	9- 103	AA	DA		D	
SSAKA3001CCZZ	9- 102	AA	DA		D	
【T】						
TCAUH0839FCZZ	4- 9	AA	DA		D	
TCAUH0891FCZZ	6- 42	AA	DA	N	D	
TCAUS0887FCZZ	3- 3	AC	DD	N	D	
TINSE0743FCZZ	9- 105	AW	FS	N	D	
TINSE0744FCZZ	9- 105	AV	FN	N	D	
TINSF0746FCZZ	9- 105	AT	FG	N	D	
TINSG0745FCZZ	9- 105	AT	FG	N	D	
TINSI0749FCZZ	9- 105	AT	FG	N	D	
TINSS0747FCZZ	9- 105	AT	FG	N	D	
TINSZ0750FCZZ	9- 105	AT	FG	N	D	
TLABH2400FCZZ	8- 13	AB	DC	N	D	
TLABZ2393FCZZ	8- 12	AA	DA	N	D	
TLABZ2396FCZZ	8- 12	AA	DA	N	D	
TLABZ2544FCZZ	8- 16	AB	DB	N	C	
【U】						
UCLEZ0102FCZZ	9- 101	AE	DJ	N	C	
UKOG-0169FCZZ	13- 1	CB	UC	N	D	
UKOG-0170FCZZ	13- 2	CW	**	N	D	
【V】						
VCCCPU1HH300J	10- 7	AA	DB		C	
//	10- 8	AA	DB		C	
VCCCTS1HH101J	12- 78	AA	DA		C	
//	12- 81	AA	DA		C	
//	12- 82	AA	DA		C	
//	12- 83	AA	DA		C	
//	12- 84	AA	DA		C	

PARTS CODE	NO.	PRICE R.		NEW	P/R	
		Ex.	Ja.			
VCCCTS1HH220J	11- 2	AA	DA		C	
//	11- 3	AA	DA		C	
VCCCTS1HH330J	12- 77	AA	DA		C	
//	12- 80	AA	DA		C	
VCCCTS1HH471J	11- 20	AA	DA		C	
//	11- 21	AA	DA		C	
//	11- 22	AA	DA		C	
//	11- 23	AA	DA		C	
//	11- 24	AA	DA		C	
//	11- 25	AA	DA		C	
//	11- 31	AA	DA		C	
//	11- 32	AA	DA		C	
//	11- 33	AA	DA		C	
//	11- 34	AA	DA		C	
//	11- 35	AA	DA		C	
VCCSPU1HL101J	12- 88	AA	DA		C	
VCEAEA0JW227M	12- 39	AB	DB		C	
VCEAEA1AW476M	10- 2	AB	DB	N	C	
//	11- 28	AB	DB	N	C	
//	11- 29	AB	DB	N	C	
//	11- 30	AB	DB	N	C	
VCEAEU1CW106M	10- 6	AA	DA		C	
VCEAJA1CW106M	12- 40	AB	DB		C	
//	12- 41	AB	DB		C	
//	12- 42	AB	DB		C	
//	12- 43	AB	DB		C	
VCEAJA1CW226M	12- 37	AB	DB		C	
//	12- 38	AB	DB		C	
//	12- 44	AB	DB		C	
VCKYPU1HB471J	10- 3	AA	DA		C	
//	10- 4	AA	DA		C	
//	10- 5	AA	DA		C	
VCKYTP1HF104Z	11- 27	AA	DA		C	
//	12- 45	AA	DA		C	
//	12- 46	AA	DA		C	
//	12- 47	AA	DA		C	
//	12- 48	AA	DA		C	
//	12- 49	AA	DA		C	
//	12- 50	AA	DA		C	
//	12- 51	AA	DA		C	
//	12- 52	AA	DA		C	
//	12- 53	AA	DA		C	
//	12- 54	AA	DA		C	
//	12- 55	AA	DA		C	
//	12- 56	AA	DA		C	
//	12- 57	AA	DA		C	
//	12- 58	AA	DA		C	
//	12- 59	AA	DA		C	
//	12- 60	AA	DA		C	
//	12- 61	AA	DA		C	
//	12- 62	AA	DA		C	
//	12- 63	AA	DA		C	
//	12- 64	AA	DA		C	
//	12- 65	AA	DA		C	
//	12- 66	AA	DA		C	
//	12- 67	AA	DA		C	
//	12- 68	AA	DA		C	
//	12- 69	AA	DA		C	
//	12- 70	AA	DA		C	
//	12- 71	AA	DA		C	
//	12- 72	AA	DA		C	
//	12- 73	AA	DA		C	
//	12- 75	AA	DA		C	
//	12- 76	AA	DA		C	
//	12- 85	AA	DA		C	
//	12- 86	AA	DA		C	
//	12- 87	AA	DA		C	
VCKYTP1HF223Z	11- 1	AA	DA		C	
//	11- 26	AA	DA		C	
VCKYTS1HR102K	12- 79	AA	DA	N	C	
VCKYTS1HR472K	11- 4	AA	DA	N	C	
//	11- 5	AA	DA	N	C	
//	11- 6	AA	DA	N	C	
//	11- 7	AA	DA	N	C	
//	11- 8	AA	DA	N	C	
//	11- 9	AA	DA	N	C	
//	11- 10	AA	DA	N	C	
//	11- 11	AA	DA	N	C	
//	11- 12	AA	DA	N	C	
//	11- 13	AA	DA	N	C	

PARTS CODE	NO.	PRICE R.		NEW	P/R	
		Ex.	Ja.			
VCKYTS1HR472K	11- 14	AA	DA	N	C	
"	11- 15	AA	DA	N	C	
"	11- 16	AA	DA	N	C	
"	11- 17	AA	DA	N	C	
"	11- 18	AA	DA	N	C	
"	11- 19	AA	DA	N	C	
VCKYTS1HR561K	12- 74	AA	DA	N	C	
VHDDA204K//--1	11- 42	AC	DC		B	
"	11- 43	AC	DC		B	
"	11- 44	AC	DC		B	
"	11- 45	AC	DC		B	
VHDDSS133HV-1	10- 13	AA	DA		B	
"	10- 14	AA	DA		B	
VHDLRS73///-1	12- 95	AA	DA		B	
"	12- 96	AA	DA		B	
VHICF78057///	12- 8	BB	GL	N	B	
VHILH2307RJ-1	12- 33	AT	FG	N	B	
VHILH2307RL-1	12- 32	AT	FG	N	B	
VHILH2464-12C	12- 16	AS	FD		B	
"	12- 21	AS	FD		B	
VHILZ93J16///	12- 4	BB	GN		B	
VHILZ93M18///	11- 49	AR	EZ		B	
VHIMC145406F1	12- 5	AL	EF	N	B	
VHIMC7805CT-1	12- 22	AD	DG		B	
VHISN74LS04NS	12- 18	AF	DP		B	
VHISN74LS14NS	12- 9	AL	EC		B	
VHISN74LS157N	12- 23	AK	ED		B	
"	12- 24	AK	ED		B	
"	12- 25	AK	ED		B	
"	12- 26	AK	ED		B	
"	12- 27	AK	ED		B	
VHISN74S74/NS	12- 15	AF	DN	N	B	
VHIS2444R///	11- 50	AP	EP	N	B	
"	12- 17	AP	EP	N	B	
VHIUPA2003C-1	11- 51	AK	EC		B	
"	11- 52	AK	EC		B	
VHI2751203DFC	12- 14	BB	GL	N	B	
VHI2751204DFC	12- 12	BB	GL	N	B	
VHI514256AZ10	12- 28	BK	HW		B	
"	12- 29	BK	HW		B	
"	12- 30	BK	HW		B	
"	12- 31	BK	HW		B	
VHI68000-08-1	12- 3	BF	HT		B	
VHI74LS125AF1	12- 10	AD	DG	N	B	
VHI74LS244F-1	12- 6	AF	DP	N	B	
"	12- 7	AF	DP	N	B	
"	12- 34	AF	DP	N	B	
"	12- 36	AF	DP	N	B	
VHI74LS245F-1	12- 19	AF	DP	N	B	
"	12- 20	AF	DP	N	B	
VHI74LS273F-1	12- 35	AF	DP	N	B	
VHI75004G553/	10- 15	AS	FE	N	B	
VHI78P214GC//	11- 48	BP	MC	N	B	
VHPGL9EG4//--1	10- 17	AC	DC		B	
"	10- 19	AC	DC		B	
VHPGL9HY4//--1	10- 16	AB	DC		B	
"	10- 18	AB	DC		B	
VHPGP1S53//--1	5- 41	AF	DP		B	
VRD-RC2EY102J	10- 22	AA	DA		C	
"	10- 25	AA	DA		C	
"	10- 26	AA	DA		C	
VRD-RC2EY103J	10- 23	AA	DA		C	
"	10- 31	AA	DA		C	
"	10- 34	AA	DA		C	
"	10- 35	AA	DA		C	
"	10- 36	AA	DA		C	
"	10- 37	AA	DA		C	
"	10- 38	AA	DA		C	
VRD-RC2EY112J	5- 40	AA	DA		C	
VRD-RC2EY202J	10- 33	AA	DA		C	
VRD-RC2EY220J	10- 20	AA	DA		C	
VRD-RC2EY221J	10- 27	AA	DA		C	
"	10- 28	AA	DA		C	
"	10- 29	AA	DA		C	
"	10- 30	AA	DA		C	
VRD-RC2EY472J	10- 21	AA	DA		C	
"	10- 24	AA	DA		C	
VRD-RC2EY822J	10- 32	AA	DA		C	
VRS-TP2BD101J	12- 100	AA	DA		C	
"	12- 102	AA	DA		C	

PARTS CODE	NO.	PRICE R.		NEW	P/R	
		Ex.	Ja.			
VRS-TP2BD101J	12- 149	AA	DA		C	
"	12- 157	AA	DA		C	
VRS-TP2BD102J	11- 93	AA	DA		C	
"	11- 95	AA	DA		C	
"	11- 100	AA	DA		C	
"	11- 109	AA	DA		C	
"	11- 111	AA	DA		C	
"	11- 114	AA	DA		C	
"	11- 116	AA	DA		C	
"	11- 118	AA	DA		C	
"	11- 120	AA	DA		C	
"	11- 125	AA	DA		C	
"	11- 128	AA	DA		C	
"	11- 129	AA	DA		C	
"	11- 131	AA	DA		C	
"	11- 134	AA	DA		C	
"	11- 138	AA	DA		C	
"	11- 139	AA	DA		C	
"	11- 140	AA	DA		C	
"	11- 141	AA	DA		C	
"	11- 144	AA	DA		C	
"	11- 145	AA	DA		C	
"	11- 146	AA	DA		C	
"	11- 147	AA	DA		C	
"	11- 148	AA	DA		C	
"	12- 105	AA	DA		C	
"	12- 143	AA	DA		C	
VRS-TP2BD103J	11- 62	AA	DA		C	
"	11- 63	AA	DA		C	
"	11- 64	AA	DA		C	
"	11- 65	AA	DA		C	
"	11- 66	AA	DA		C	
"	11- 67	AA	DA		C	
"	11- 68	AA	DA		C	
"	11- 69	AA	DA		C	
"	11- 70	AA	DA		C	
"	11- 71	AA	DA		C	
"	11- 72	AA	DA		C	
"	11- 73	AA	DA		C	
"	11- 74	AA	DA		C	
"	11- 80	AA	DA		C	
"	11- 81	AA	DA		C	
"	11- 82	AA	DA		C	
"	11- 83	AA	DA		C	
"	11- 84	AA	DA		C	
"	11- 85	AA	DA		C	
"	11- 86	AA	DA		C	
"	11- 87	AA	DA		C	
"	11- 88	AA	DA		C	
"	11- 89	AA	DA		C	
"	11- 90	AA	DA		C	
"	11- 91	AA	DA		C	
"	11- 92	AA	DA		C	
"	11- 94	AA	DA		C	
"	11- 96	AA	DA		C	
"	11- 97	AA	DA		C	
"	11- 98	AA	DA		C	
"	11- 99	AA	DA		C	
"	11- 101	AA	DA		C	
"	11- 102	AA	DA		C	
"	11- 103	AA	DA		C	
"	11- 104	AA	DA		C	
"	11- 105	AA	DA		C	
"	11- 106	AA	DA		C	
"	11- 107	AA	DA		C	
"	11- 108	AA	DA		C	
"	11- 110	AA	DA		C	
"	11- 112	AA	DA		C	
"	11- 113	AA	DA		C	
"	11- 115	AA	DA		C	
"	11- 117	AA	DA		C	
"	11- 121	AA	DA		C	
"	11- 122	AA	DA		C	
"	11- 123	AA	DA		C	
"	11- 124	AA	DA		C	
"	11- 135	AA	DA		C	
"	12- 106	AA	DA		C	
"	12- 108	AA	DA		C	
"	12- 109	AA	DA		C	
"	12- 145	AA	DA		C	

JX9500

PARTS CODE	NO.	PRICE R.		NEW	P/R
		Ex.	Ja.		
VRS-TP2BD103J	12- 146	AA	DA		C
//	12- 147	AA	DA		C
//	12- 148	AA	DA		C
//	12- 150	AA	DA		C
//	12- 151	AA	DA		C
//	12- 152	AA	DA		C
//	12- 153	AA	DA		C
//	12- 154	AA	DA		C
//	12- 155	AA	DA		C
//	12- 156	AA	DA		C
VRS-TP2BD105J	11- 78	AA	DA		C
VRS-TP2BD122J	11- 130	AA	DA		C
VRS-TP2BD202J	11- 53	AA	DA		C
//	11- 54	AA	DA		C
//	11- 55	AA	DA		C
//	11- 56	AA	DA		C
//	11- 57	AA	DA		C
//	11- 58	AA	DA		C
//	11- 59	AA	DA		C
//	11- 60	AA	DA		C
//	11- 61	AA	DA		C
//	11- 77	AA	DA		C
VRS-TP2BD220J	12- 107	AA	DA		C
//	12- 112	AA	DA		C
//	12- 113	AA	DA		C
//	12- 114	AA	DA		C
//	12- 115	AA	DA		C
//	12- 116	AA	DA		C
//	12- 117	AA	DA		C
//	12- 118	AA	DA		C
//	12- 119	AA	DA		C
//	12- 120	AA	DA		C
//	12- 121	AA	DA		C
//	12- 122	AA	DA		C
//	12- 123	AA	DA		C
//	12- 124	AA	DA		C
//	12- 125	AA	DA		C
//	12- 126	AA	DA		C
//	12- 127	AA	DA		C
//	12- 128	AA	DA		C
//	12- 129	AA	DA		C
//	12- 130	AA	DA		C
//	12- 131	AA	DA		C
//	12- 132	AA	DA		C
//	12- 133	AA	DA		C
//	12- 134	AA	DA		C
//	12- 135	AA	DA		C
//	12- 136	AA	DA		C
//	12- 137	AA	DA		C
//	12- 138	AA	DA		C
//	12- 139	AA	DA		C
//	12- 140	AA	DA		C
//	12- 141	AA	DA		C
//	12- 142	AA	DA		C
VRS-TP2BD221J	11- 75	AB	DB		C
//	11- 143	AB	DB		C
//	11- 149	AB	DB		C
VRS-TP2BD222J	12- 99	AA	DA		C
//	12- 101	AA	DA		C
VRS-TP2BD331J	11- 76	AB	DB		C
//	11- 79	AB	DB		C
VRS-TP2BD332J	12- 158	AA	DA		C
VRS-TP2BD392F	11- 126	AA	DA	N	C
VRS-TP2BD472J	11- 132	AA	DA		C
//	11- 133	AA	DA		C
//	11- 136	AA	DA		C
//	11- 137	AA	DA		C
//	11- 142	AA	DA		C
VRS-TP2BD473J	11- 119	AA	DA		C
//	11- 127	AA	DA		C
VRS-TP2BD561J	12- 103	AA	DA		C
//	12- 104	AA	DA		C
//	12- 110	AA	DA		C
//	12- 111	AA	DA		C
//	12- 144	AA	DA		C
VSJC501-P//--1	10- 47	AB	DB		B
//	12- 181	AB	DB		B
VS2SA673A//--1	12- 182	AD	DH		B
VVLLM16155K-1	1- 8	AZ	GD		B
(X)					

[illegible]

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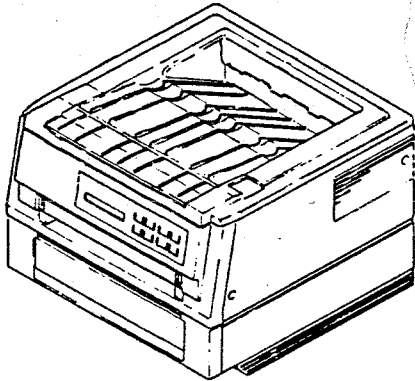
SHARP CORPORATION
Printing and Reprographic Systems Group
Quality & Reliability Control Center
Yamatokoriyama, Nara 639-11, Japan
November 1989 Printed in Japan



V11720

JX-9500E

SHARP SERVICE MANUAL



CODE: 00ZJX9500ESME

LASER PRINTER MODEL JX-9500E

This Service Manual describes only the difference from the JX-9500, and the other contents are the same as the JX-9500.

Please refer the JX-9500 Service Manual and Parts Guide.

CAUTION

This laser printer is a class 1 laser product complied with 21CFR 1040.10 and 1040.11 of the CDRH standard and IEC825. This means that this machine does not produce a hazardous laser radiation. The use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

This laser radiation is not a danger to the skin, but when an exact focusing of the laser beam is achieved on the eye's retina, there is danger of spot damage to the retina.

The following cautions must be observed to avoid exposure of the laser beam to your eyes at the time of servicing.

- 1) When a problem in the laser optical unit has occurred, the whole optical unit must be exchanged as a unit, not an individual part.
- 2) Do not look into the machine with the main switch turned on after removing the developer unit, toner cartridge, and drum cartridge.
- 3) Do not look into the laser beam exposure slit of the laser optical unit with the connector connected when removing and installing the optical system.
- 4) The upper frame contains the safety interlock switch.

Do not defeat the safety interlock by inserting wedges or other items into the switch slot.

The required Labels and hazard warnings from IEC standard 825.

(220V, 240V machine only)

**CLASS 1
LASER PRODUCT**

LASER KLASSE 1

CAUTION

INVISIBLE LASER RADIATION,
WHEN INTERLOCKS DEFEATED AND
TONER-DEVELOPER CARTRIDGE REMOVED.

VORSICHT

UNSICHTBARE LASERSTRAHLUNG,
WENN INTERLOCK ÜBERBRÜCKT IST UND
TONER-SOWIE ENTWICKLUNGSEINHEIT
ENTFERNT SIND.

ADVARSEL

USYNLIG LASERSTRÅLING VED ÅBNING NÅR
SIKKERHEDSAFBRYDERE ER UDE AF
FUNKTION. UNDGÅ UDSÆTTELSE FOR
STRÅLING.

VAROITUS I

Laite sisältää laserdiodin, joka lähettää
näkyvättöntä silmille vaarallista lasersäteilyä.

SHARP CORPORATION

This document has been published to be used
for after sales service only.
The contents are subject to change without notice.

JX-9500E

The JX-9500E is the revised version of the current machine JX-9500.

The revised items are as follows:

1. The LCD display message on the control panel and Self Test #1 message are displayed in 5 languages (English, German, French, Italian, and Spanish). The selection of 5 languages is made with the keyboard (configuration menu).
(The current display is only in English.)
2. The max. capacity of a font card is extended from the current 128KB to 512KB. (Two bus lines for the font card slot are added.)
3. When changing various settings with the control panel, the off-line display is changed from the current "TRAY = (Paper size)" to "READY" in order to clarify the original point and facilitate the operation.
4. A large part of settings which are currently changed by the printing menu can be changed by commands. Refer to the attached table, "Additional commands and revised specifications" and "Details of additional commands and revised specifications".

With the above improvement in the functions, the following parts are subject to change.

1. Comparison with JX-9500 and JX-9500E

P/G No.	JX-9500	JX-9500E		PARTS NAME	Remarks
	PARTS CODE	PARTS CODE	PRICE RANK		
1-4	CCAB-0629FC01	CCAB-0006GC01	AT	Front cabinet	
9-5	SPAKC3826FCZZ	SPAKC4422FCZZ	AP	Packing case	
12-12	VHILH2307E7-1 (T/R LPE-025)	VHILH2306R7-1	AR	Program ROM (4C)	
12-14	VHILH2307E6-1 (T/R LPE-025)	VHILH2306R6-1	AR	Program ROM (4D)	
12-91	QCNCM1039HC6J	QCNCM0688FCZZ	AR	Connector (CN52)	LPE-035
12-94	QCNCM1039HC6J	QCNCM0688FCZZ	AR	Connector (CN53)	LPE-035
12-117	VRS-TP2BD220J	VRS-TW2ED220J	AA	Resistor 1/4W 22Ω ± 5%	
12-901	CPWBN0735FC54 (T/R LPE-032)	CPWBN0735FC57	CL	ICU PWB	
9-105	TINSE0743FCZZ	TINSE0008GCZZ	AW	Operation manual USA	
	TINSE0744FCZZ	TINSE0009GCZZ	AV	English	
	TINSF0746FCZZ	TINSF0011GCZZ	AT	French	
	TINSS0747FCZZ	TINSS0012GCZZ	AT	Spanish	
	TINSG0745FCZZ	TINSG0010GCZZ	AT	Germany	
	TINSI0749FCZZ	TINSI0013GCZZ	AT	Italy	
	TINSZ0750FCZZ	TINSZ0014GCZZ	AT	Sweden	

Additional commands and revised specifications

		JX-9500	JX-9500E
[Commands]	Emulation		
Page size change command	HP	YES	B5, INVOICE, and AFSP are added.
Embedded commands	D630, IBM, FX	NO	Newly added.
Paper source change commands	D630, IBM, FX	NO	Newly added.
Paper size commands	D630, IBM, FX	NO	Newly added.
Orientation	IBM, FX	NO	Newly added.
Select font	D630	NO	Newly added.
Emulation change	ALL	NO	Newly added.
[Specification change]	Emulation		
A4 size 80 characters	HP	Print impossible	After selecting with key operation, printing is allowed.
Z font card	HP	Application impossible	Application is possible by changing the controller.
Centronix I/F timing change	ALL	Timing = 1 or 2	"Timing = 3" is added.
F NUMBER with symbol set	HP	No change	Font number and font source are changed with symbol set.
Tag counter	ALL	Reduction system	Accumulation system from 0.
LED in off-line	ALL	Paper feed system is displayed.	READY is displayed. The paper feed system is included in the menu mode.
Font card error Discrepancy between the emulation and the font card	ALL	Error display "FC MISMATCH"	The error font card is ignored.
Data bit addition by RS232C	ALL	No	Included in the configuration menu.
Parity addition by RS232C	ALL	No	Included in the configuration menu.
Auto tray change	ALL	The function is invalid when only the envelope feeder is installed.	The function is valid even when only the envelope feeder is installed.
	ALL	Returns to NO by turning off the power.	Setting is stored even when the power is turned off.

2-1. Details of additional commands and revised specifications

HP	PAGE SIZE CHANGE COMMAND
ESC & 1 # A	
# = 1	EXECUTIVE
# = 2	LETTER
# = 3	LEGAL
# = 26	A4
# = 80	MONARCH 7 3/4
# = 81	COMMERCIAL 10
# = 90	INTERNATIONAL DL
# = 91	INTERNATIONAL C5
Newly added	
# = 31	B5 (JIS 182mm x 257mm)
# = 24	INVOICE
# = 32	AFSP GOVERNMENT LETTER 10.5" x 8"

D630, IBM, FX	EMBEDDED COMMANDS
In FX, PP, GP, D630 emulation, also support EMBEDDED COMMAND, but only additional command in case of EMBEDDED COMMAND.	
EXPLANATION	
For example, in case of PAPER SOURCE COMMAND, //n// sent by ASCII is comprehended and controlled as ESC command.	
BASIC CONCEPT	
EMBEDDED COMMAND can be controlled only at linehead. In other cases, it is controlled as printable data. Start the line with CR CODE if EMBEDDED command is included. Don't include other printable data (except space). Finish with CR CODE. Possible to finish with CR LF, but LF is carried out. In case of //nA//, ignore the former command when DATA A is received.	

D630, IBM, FX	PAPER SOURCE CHANGE
ESC EM n (//n//)	
n = 1	TRAY1
n = 2	TRAY2
n = E	ENVELOPE FEEDER
n = M	MANUAL
n = C	SELECT TRAY1 THEN TRAY2
n = R	EJECT THE CURRENT PAGE
EXPLANATION	
Work as PAPER SOURCE COMMAND of HP	

D630, IBM, FX	PAPER SIZE COMMAND
ESC d (n) (//d(n)//)	
n = B	LEGAL
n = D	LETTER
n = P	EXECUTIVE
n = E	INVOICE
n = H	A4
n = L	B5
n = R	COMMERCIAL 10
n = S	INTERNATIONAL DL
n = U	INTERNATIONAL C5
n = M	MONARCH 7 3/4
n = G	AFSP GOVERNMENT LETTER
EXPLANATION	
Work as HP	

IBM, FX	ORIENTATION
ESC VP PORTRAIT (//P//)	
ESC VL LANDSCAPE (//L//)	

D630	ORIENTATION
ESC	PORTRAIT (//I//)
ESC _	LANDSCAPE (//_//)

D630	SELECT FONT
ESC F(n)	INTERNAL FONT (//F(#)//)
ESC FI(n)	INTERNAL FONT (//FI(#)//)
ESC FA(n)	A FONT SLOT (//FA(#)//)
ESC FB(n)	B FONT SLOT (//FB(#)//)
ESC G(n)	INTERNAL FONT & ADJUST SPACING (//G(#)//)
ESC GI(n)	INTERNAL FONT & ADJUST SPACING (//GI(#)//)
ESC GA(n)	A FONT SLOT & ADJUST SPACING (//GA(#)//)
ESC GB(n)	B FONT SLOT & ADJUST SPACING (//GB(#)//)
EXPLANATION	
Possible to choose font by n or #	
Conform to the number of FONT PRINTOUT	
This command is ignored without FONT	

ALL	EMULATION CHANGE
ESC - ESC - (n) A	
n = 1	DEFAULT EMULATION
n = 2	FX-80
n = 3	D630
n = 4	HPLJ II
n = 5	IBM PP
n = 6	IBM GP
EXPLANATION	
Analyzed this command, print out that page if printable data is included.	
After print out all pages, format all the WORKRAM except I/F buffer.	

HP A4 SIZE 80 CHARACTER * WITHOUT USA**SPECIFICATION**

Widen the margin to print 80 character in A4 size by HP emulation.

Choose 77 or 80 by key operation in printing menu mode.

EXPLANATION

KEY routine

Changeable "LINE FORMAT = 77"

"LINE FORMAT = 80"

* This function isn't USA.

HP Z FONT card (FONT card capacity out of 128kb)**SPECIFICATION**

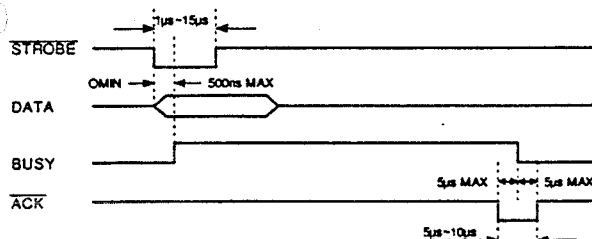
Z FONT card — 512KB

Change hard, soft to use it.

Necessary to change controller board.

ALL CENTRO I/F TIMING CHANGE**SPECIFICATION**

Exist timing 1, timing 2 now, in addition make timing 3.

**HP FONT NUMBER BY SYMBOL SET****SPECIFICATION**

In changing SYMBOL SET or in carrying out RESET, judge the SYMBOL SET and for example, in case of 7BIT system, set the following mode automatically.

FONT NUMBER = 24

FONT SOURCE = 1

ALL DIAG COUNTER**SPECIFICATION**

LIFE counter of SETTING PRINTOUT (SELF TEST #1) ACT AS ADDITIONAL COUNTER.

EXPLANATION

MACHINE LIFE 0 ~

DEVELOPER 0 ~

DRUM 0 ~

ALL OFF LINE DISPLAY**SPECIFICATION**

Change LCD display at OFF LINE. Display "READY".

TRAY change is included in printing menu mode.

EXPLANATION

Though timing for tray change is set on pushing the ENTER KEY, it is changed at the beginning of the next page, not at that page.

ALL FONT CARD ERROR**SPECIFICATION**

If the FONT card is different from emulation, stop the "FC MISMATCH" display and ignore the card.

ALL RS232 DATA BIT AND PARITY ADDITION**SPECIFICATION**

Change RS232 DATA BIT and PARITY by key operation.

Set in configuration menu mode

DATA BIT = 8 DEFAULT SETTING

7

PARTITY = NON DEFAULT SETTING

EVN

ODD

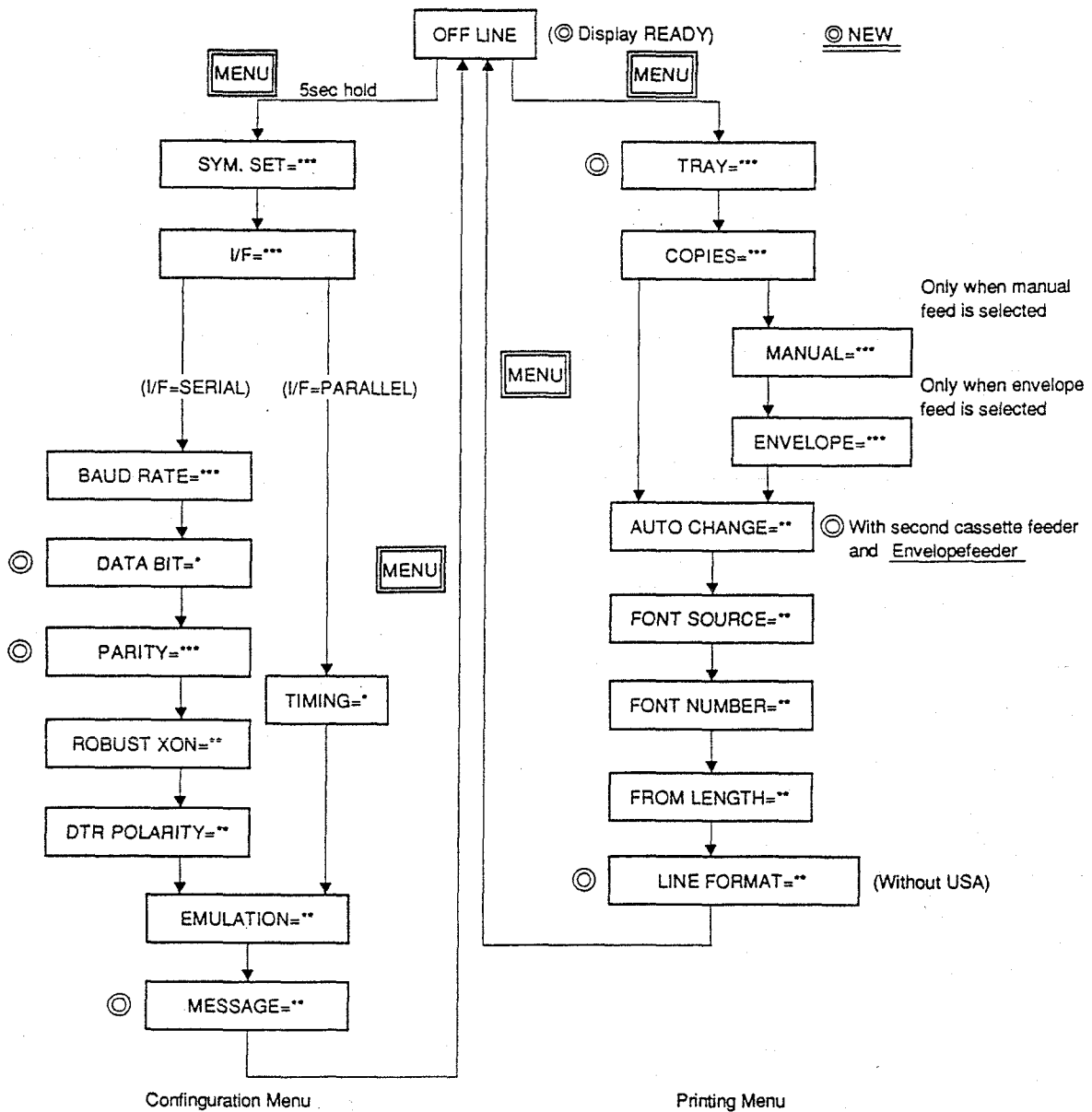
ALL AUTO TRAY CHANGE**SPECIFICATION**

① Function as well at only with envelope feeder.

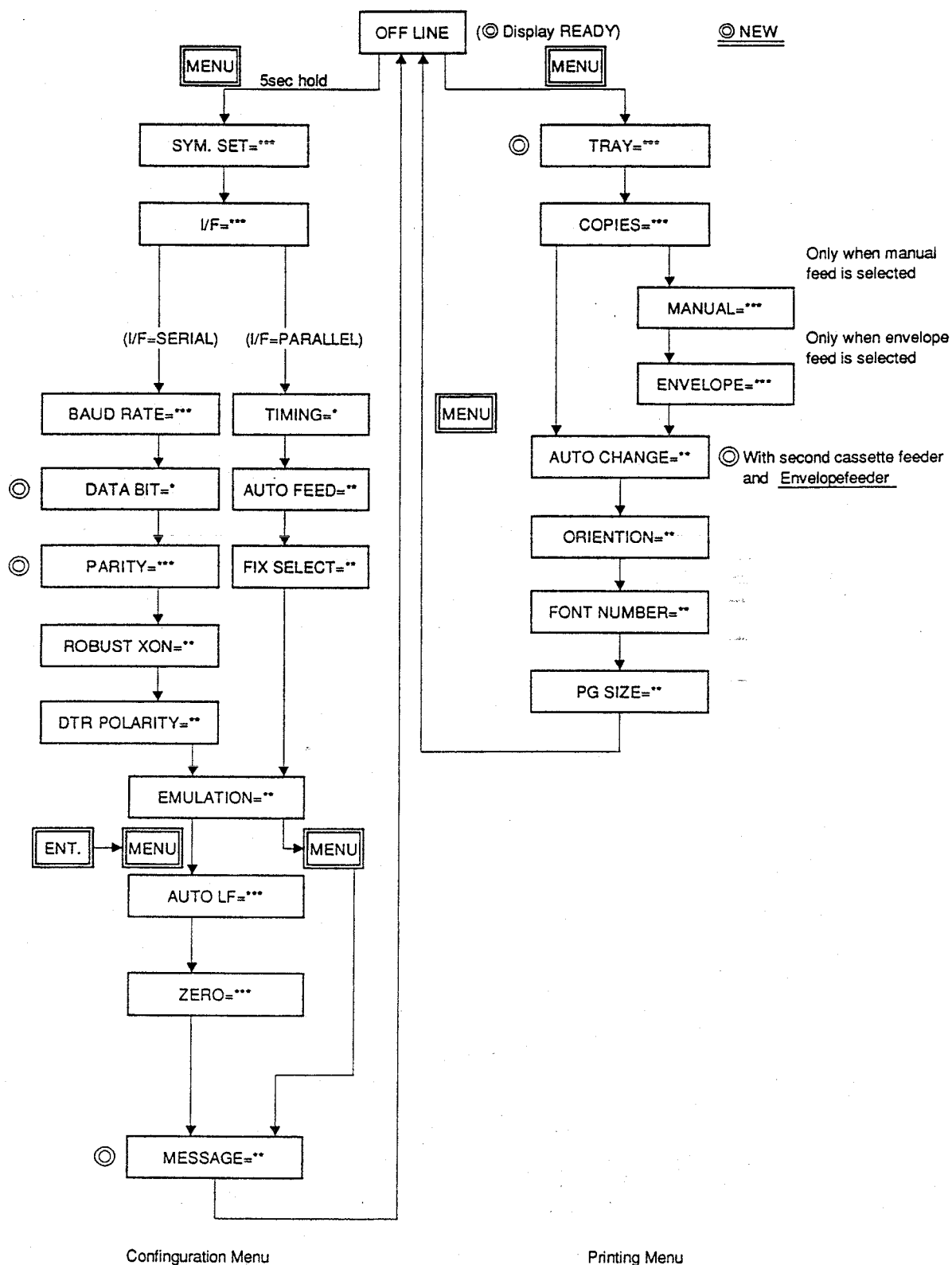
② Having set the AUTO TRAY CHANGE "YES", it turned back to "NO" at power "OFF", but this one can store setting at power "OFF".

2-2. MENU SETTING STRUCTURE

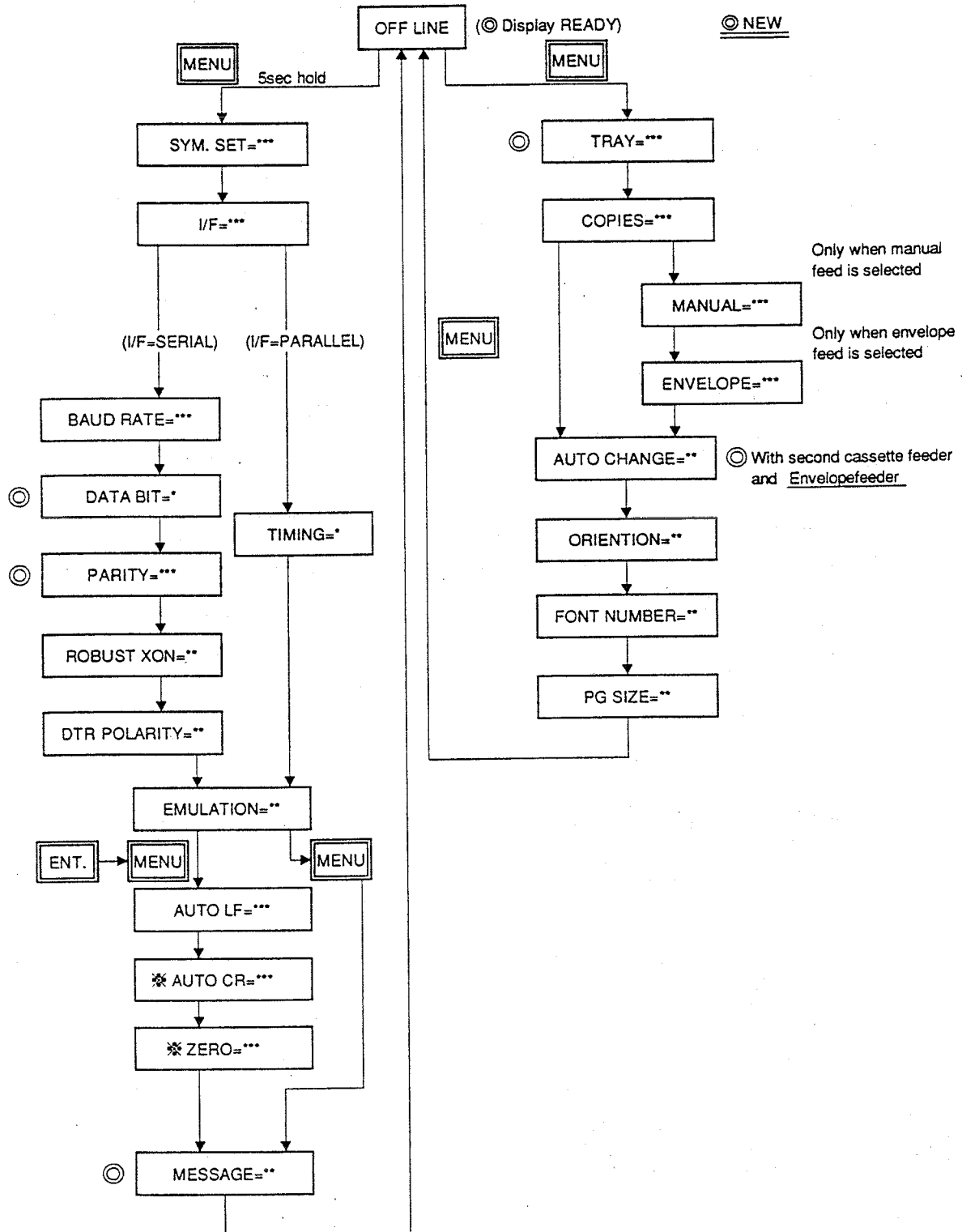
1) HP Laser JET serie II



FX-80



III) IBM Proprinter/Graphicprinter

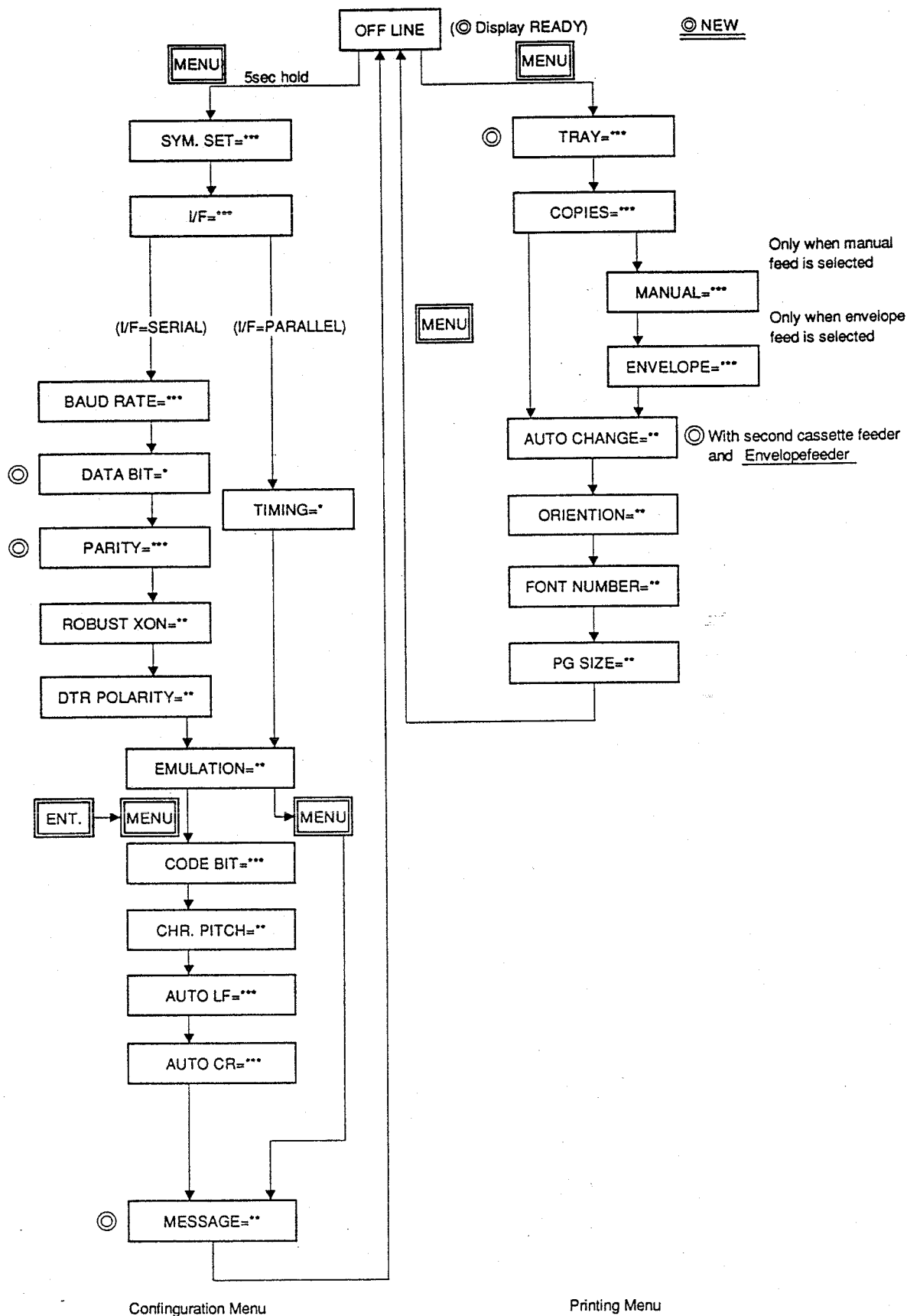


✱ IBM Proprinter only

Configuration Menu

Printing Menu

Diablo 630/630ECS



3. Change in the ICU PWB and the circuit

With the addition of the bus lines, the ICU PWB and the circuit are changed as follows:

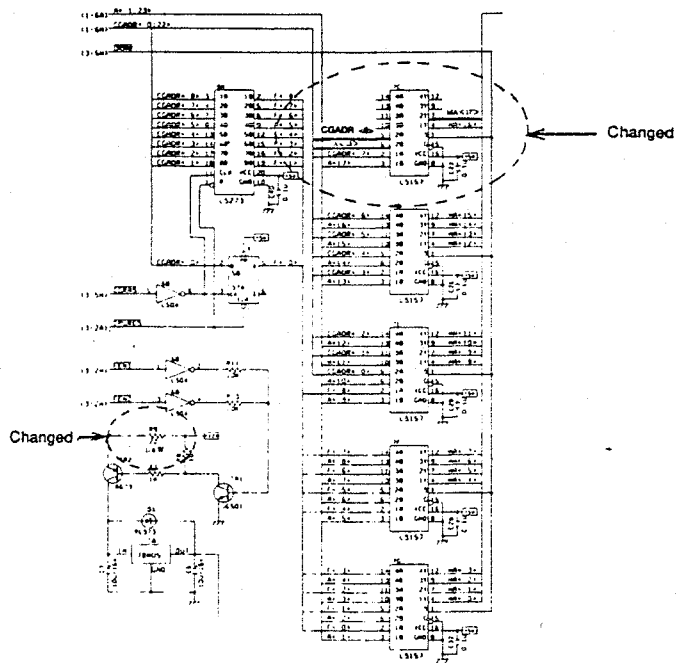
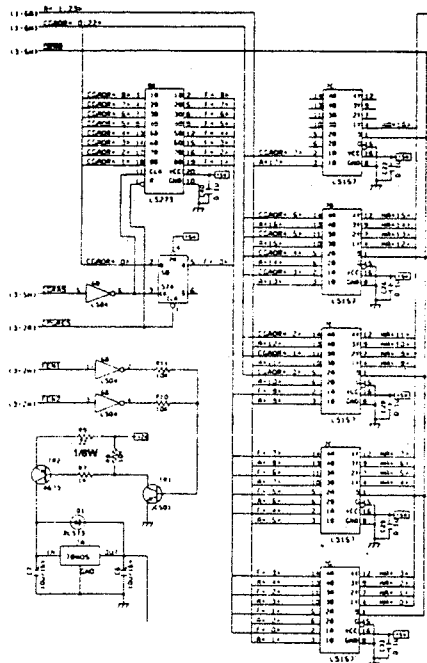
JX-9500 (CPWBN0735FC51)

JX-9500E (CPWBN0735FC57)

JX-9500 (CPWBN0735FC54)

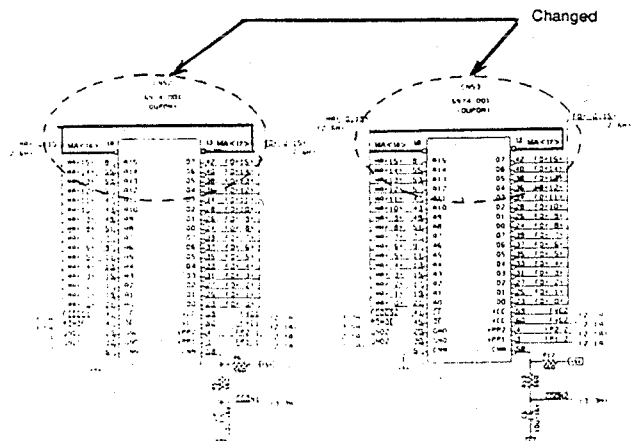
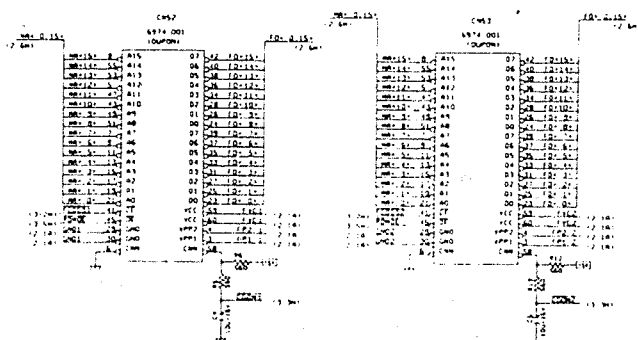
[7] ICU CIRCUIT-2 (MEMORY SECTION)

[7] ICU CIRCUIT-2 (MEMORY SECTION)



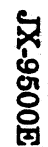
ICU CIRCUIT-4 (CONNECTOR SECTION)

ICU CIRCUIT-4 (CONNECTOR SECTION)

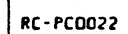


Refer to the attached ICU PWB, the circuit diagram and Parts List.

1/4

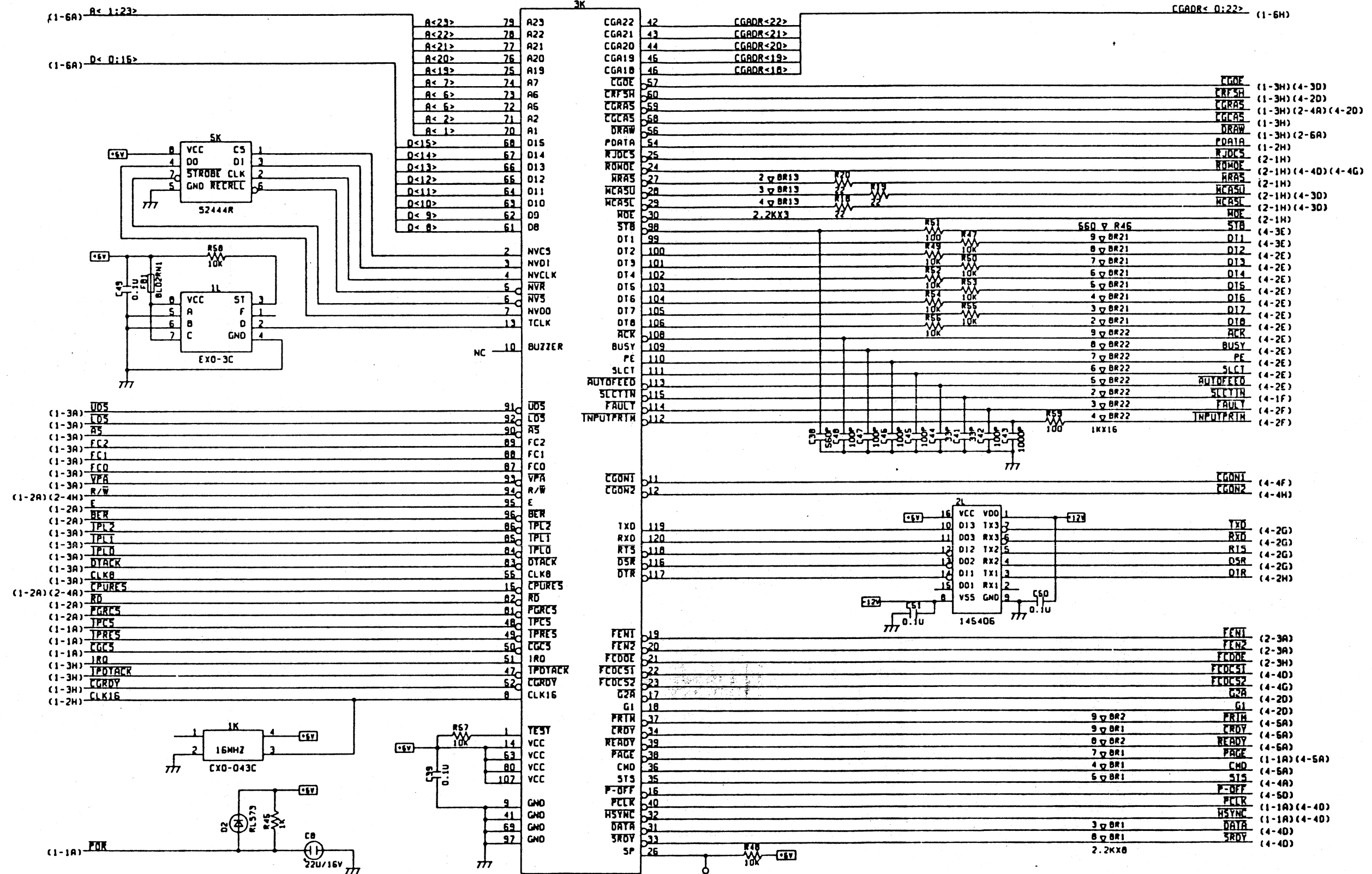


2/4



[7] ICU CIRCUIT-3 (I/F LSI SECTION)

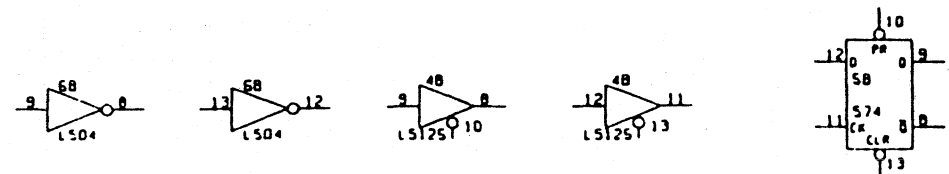
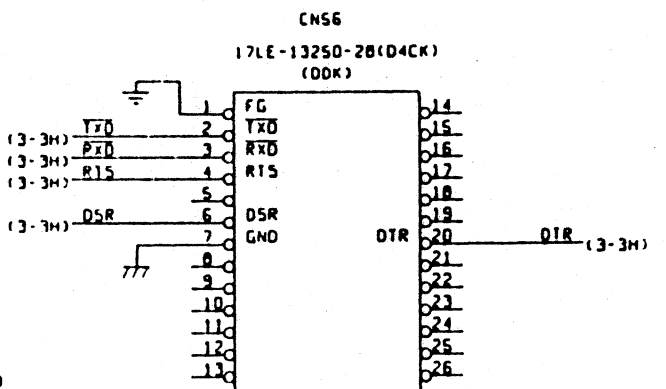
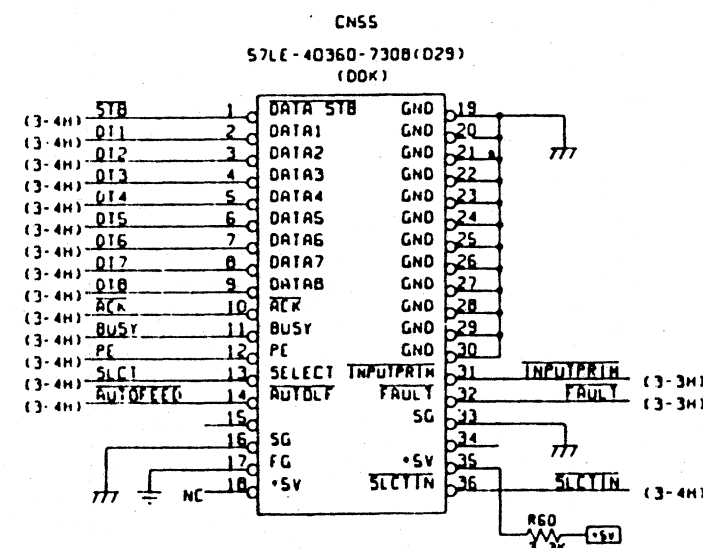
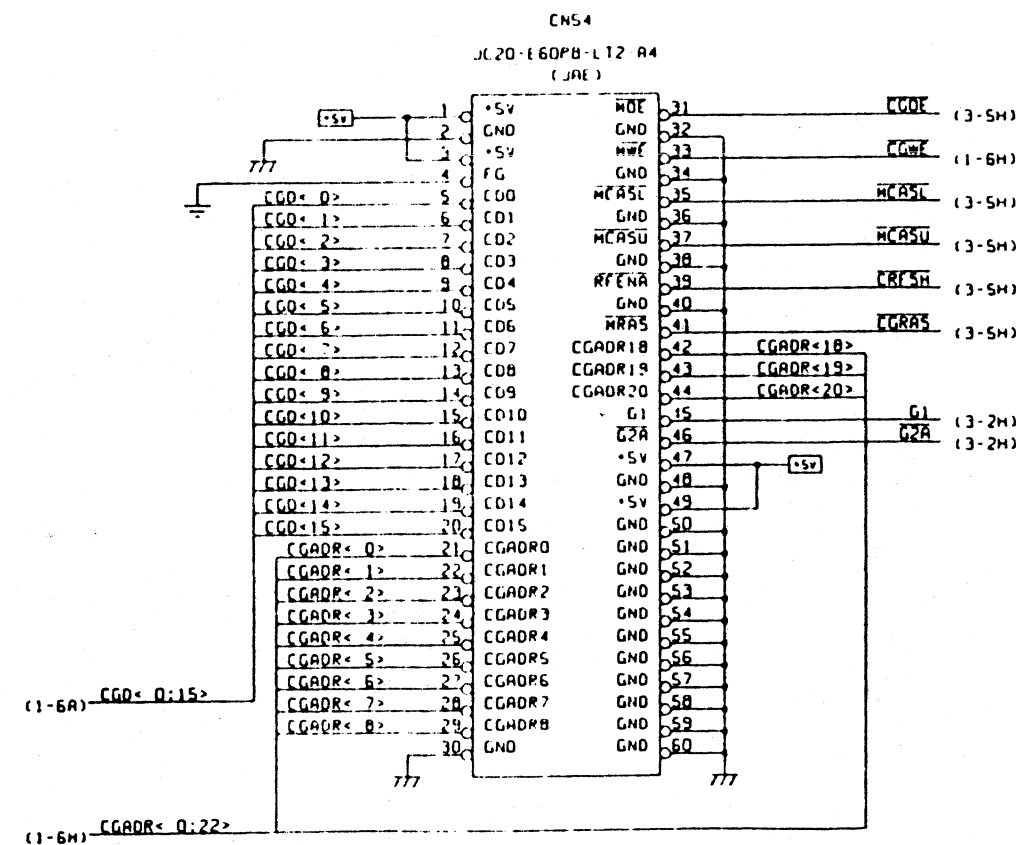
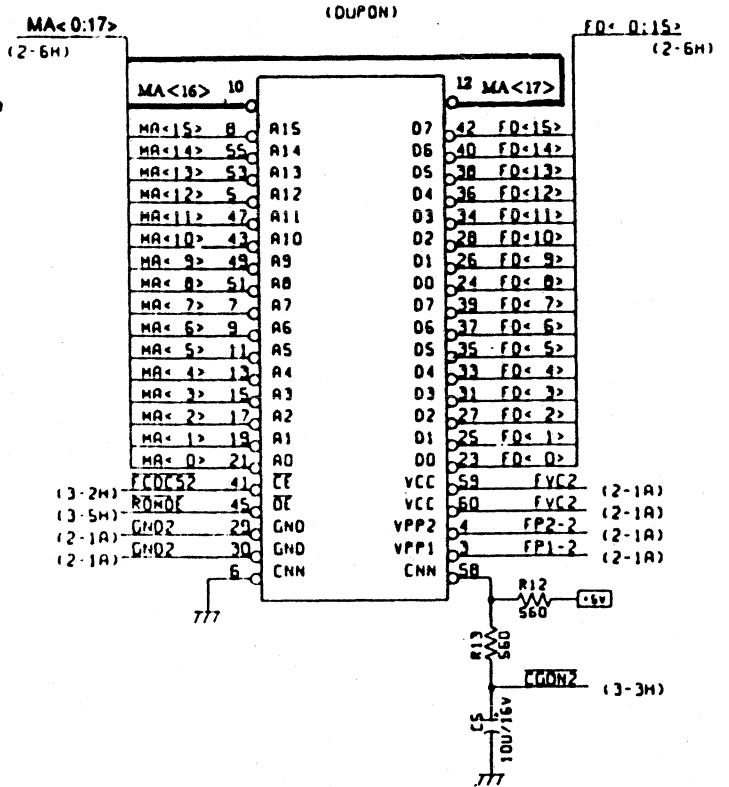
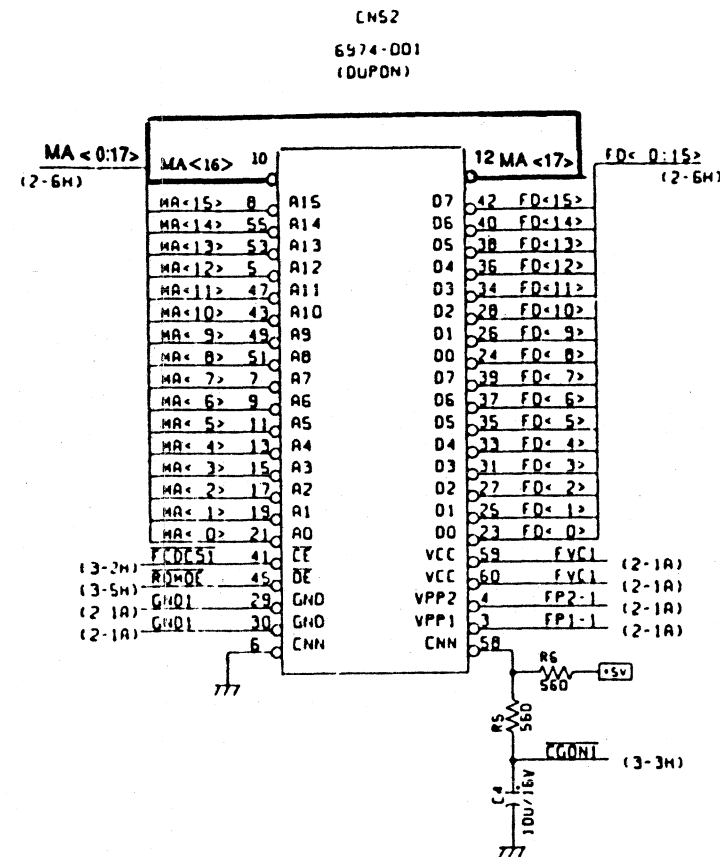
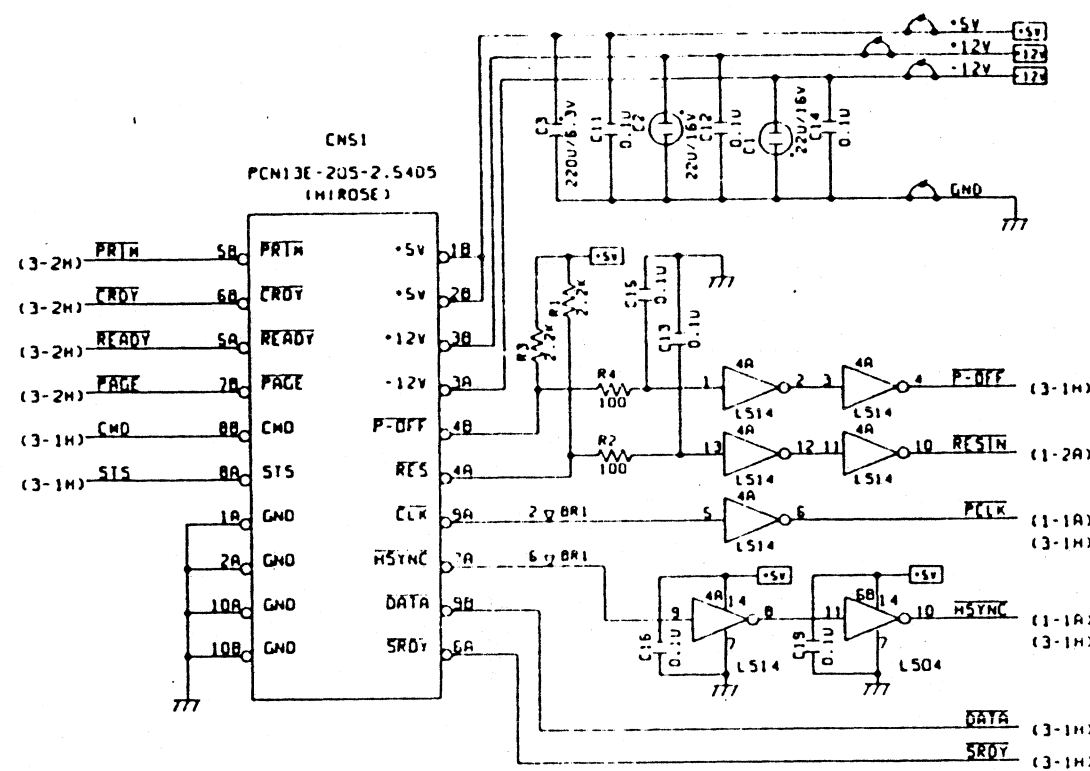
3/4



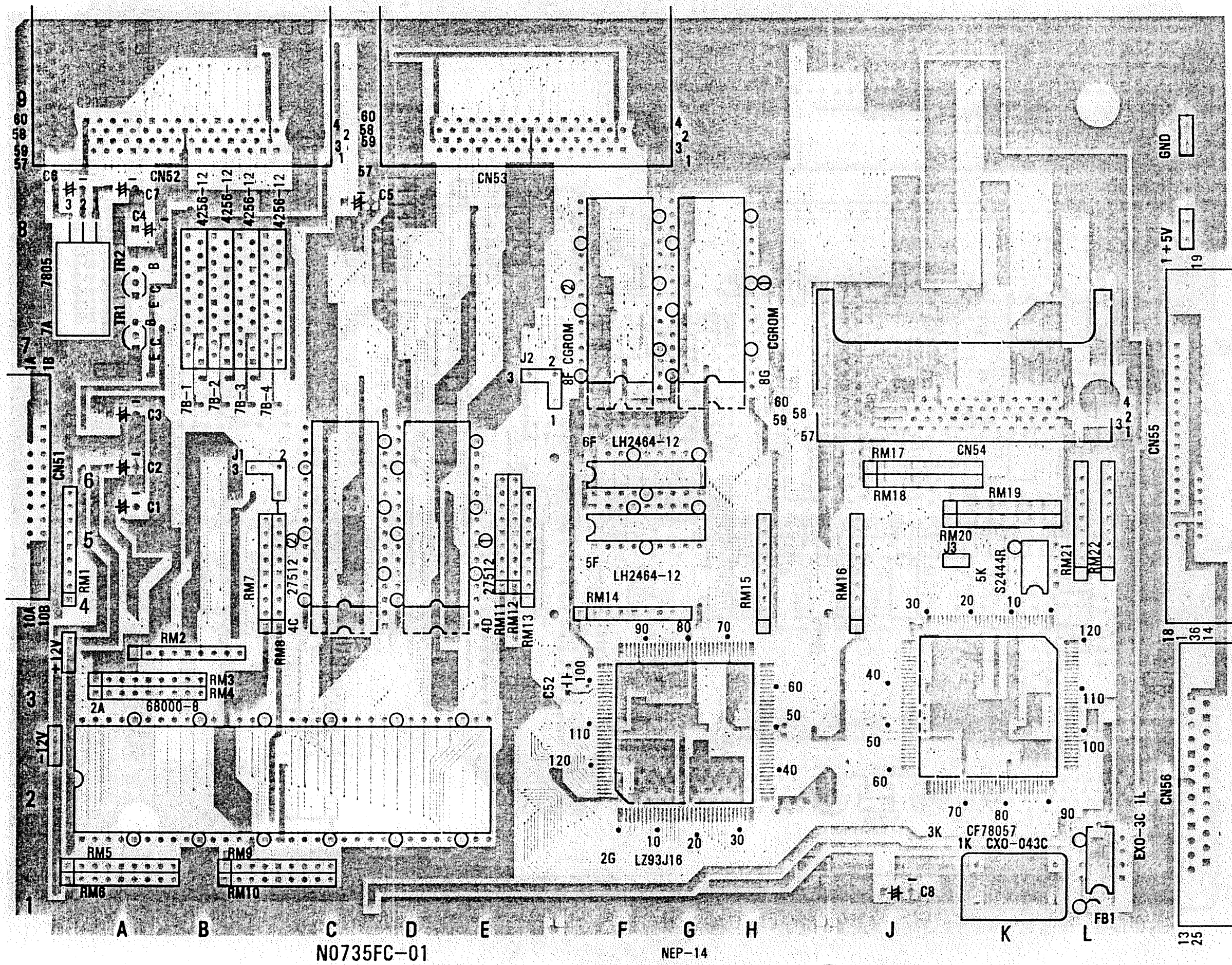
[7] ICU CIRCUIT-4 (CONNECTOR SECTION)

4/4

JX-95001E

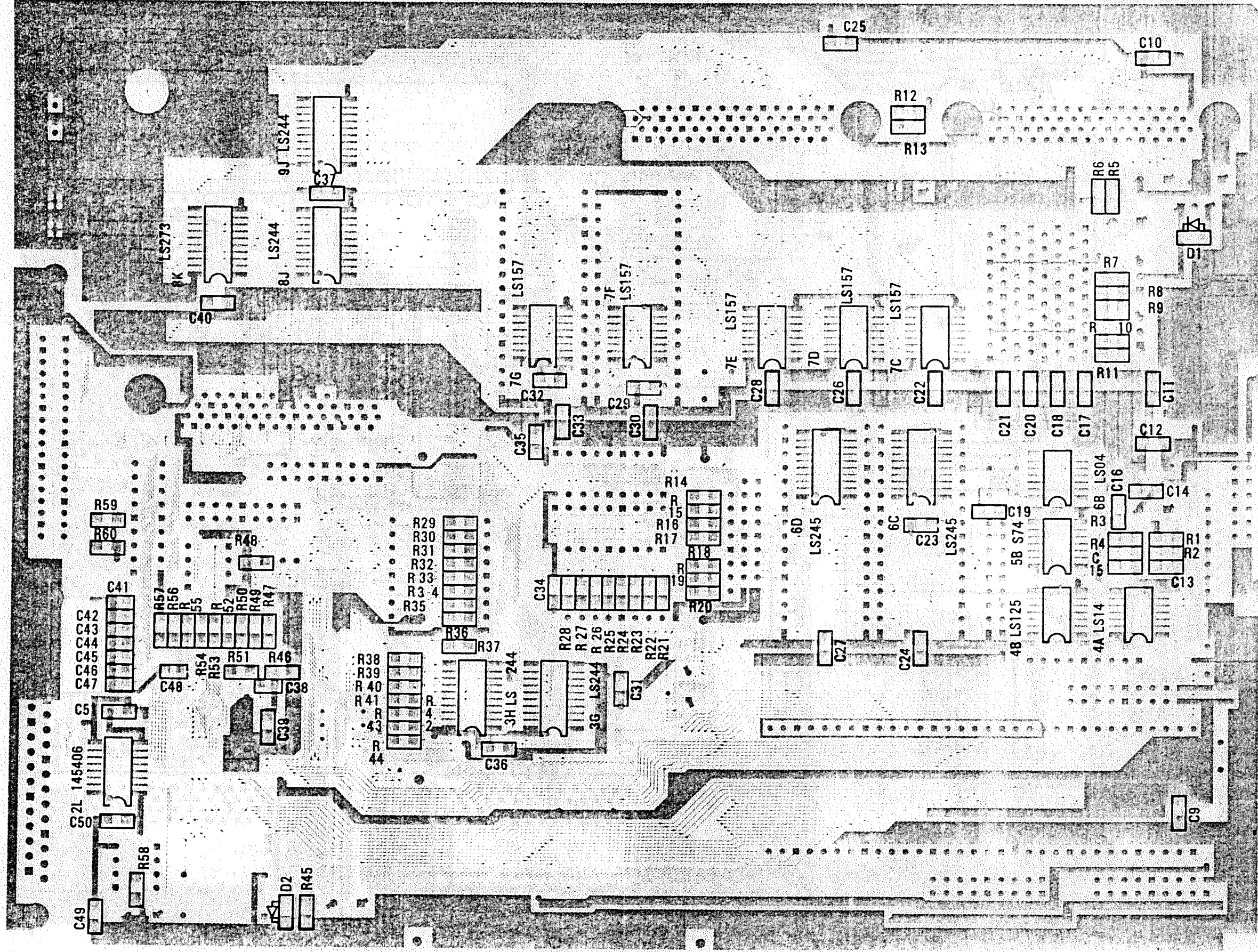


[7] ICU P.W.B. (TOP VIEW)



JX-9500E

[7] ICU P.W.B. (BOTTOM VIEW)



12 ICU PWB

NO.	PARTS CODE	OEM CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	RCRS-1014ACZZ		A U		B	Crystal (16MHz)	[1K]
2	RCRSZ1009HCZZ		A R		B	Crystal (66MHz)	[1L]
3	VHi68000-08-1		B F		B	LSI,CPU (MC68000)	[2A]
4	VHiLZ93J16///		B B		B	IC (LZ93J16)	[2G]
5	VHiMC145406F1		A L		B	IC (MC145406)	[2L]
6	VHi74LS244F-1		A F		B	IC (74LS244)	[3G]
7	VHi74LS244F-1		A F		B	IC (74LS244)	[3H]
8	VHiCF78057///		B B		B	IC (CF78057)	[3K]
9	VHiSN74LS14NS		A L		B	IC (SN74LS14F)	[4A]
10	VHi74LS125AF1		A D		B	IC (74LS125)	[4B]
11	QSOCZ2042SC32		A E		C	IC socket (32pin)	[4C]
12	VHiLH2306R7-1		A R	N	B	IC (LH2306R7)	[4C]
13	QSOCZ2042SC32		A E		C	IC socket (32pin)	[4D]
14	VHiLH2306R6-1		A R	N	B	IC (LH2306R6)	[4D]
15	VHiSN74S74/NS		A F		B	IC (SN74S74)	[5B]
16	VHiLH2464-12C		A S		B	IC (LH2464-12C)	[5F]
17	VHiS2444R///		A P		B	IC (S2444R)	[5K]
18	VHiSN74LS04NS		A F		B	IC (SN74LS04)	[6B]
19	VHi74LS245F-1		A F		B	IC (74LS245)	[6C]
20	VHi74LS245F-1		A F		B	IC (74LS245)	[6D]
21	VHiLH2464-12C		A S		B	IC (LH2464-12C)	[6F]
22	VHiMC7805CT-1		A D		B	IC (MC7805CT)	[7A]
23	VHiSN74LS157N		A K		B	IC (SN74LS157N)	[7C]
24	VHiSN74LS157N		A K		B	IC (SN74LS157N)	[7D]
25	VHiSN74LS157N		A K		B	IC (SN74LS157N)	[7E]
26	VHiSN74LS157N		A K		B	IC (SN74LS157N)	[7F]
27	VHiSN74LS157N		A K		B	IC (SN74LS157N)	[7G]
28	VHi514256AZ10		B K		B	IC (514256AZ10)	[7B-1]
29	VHi514256AZ10		B K		B	IC (514256AZ10)	[7B-2]
30	VHi514256AZ10		B K		B	IC (514256AZ10)	[7B-3]
31	VHi514256AZ10		B K		B	IC (514256AZ10)	[7B-4]
32	VHiLH2307RL-1		A T		B	IC (LH2307RL)	[8F]
33	VHiLH2307RJ-1		A T		B	IC (LH2307RJ)	[8G]
34	VHi74LS244F-1		A F		B	IC (74LS244)	[8J]
35	VHi74LS273F-1		A F		B	IC (74LS273)	[8K]
36	VHi74LS244F-1		A F		B	IC (74LS244)	[9J]
37	VCEAJA1CW226M		A B		C	Capacitor (16WV 22μF)	[C1]
38	VCEAJA1CW226M		A B		C	Capacitor (16WV 22μF)	[C2]
39	VCEAJA1CW227M		A B		C	Capacitor (6.3WV 220μF)	[C3]
40	VCEAJA1CW106M		A B		C	Capacitor (16WV 10μF)	[C4]
41	VCEAJA1CW106M		A B		C	Capacitor (16WV 10μF)	[C5]
42	VCEAJA1CW106M		A B		C	Capacitor (16WV 10μF)	[C6]
43	VCEAJA1CW106M		A B		C	Capacitor (16WV 10μF)	[C7]
44	VCEAJA1CW226M		A B		C	Capacitor (16WV 22μF)	[C8]
45	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C9]
46	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C10]
47	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C11]
48	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C12]
49	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C13]
50	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C14]
51	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C15]
52	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C16]
53	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C17]
54	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C18]
55	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C19]
56	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C20]
57	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C21]
58	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C22]
59	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C23]
60	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C24]
61	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C25]
62	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C26]
63	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C27]
64	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C28]
65	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C29]
66	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C30]
67	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C31]
68	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C32]
69	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C33]
70	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C34]
71	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C35]
72	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C36]
73	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C37]
74	VCKYTS1HR561K		A A		C	Capacitor (50WV 560PF)	[C38]
75	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C39]
76	VCKYTP1HF104Z		A A		C	Capacitor (50WV 0.10μF)	[C40]
77	VCCCTS1HH330J		A A		C	Capacitor (50WV 33PF)	[C41]
78	VCCCTS1HH101J		A A		C	Capacitor (50WV 100PF)	[C42]
79	VCKYTS1HR102K		A A		C	Capacitor (50WV 1000PF)	[C43]
80	VCCCTS1HH330J		A A		C	Capacitor (50WV 33PF)	[C44]

12 ICU PWB

NO.	PARTS CODE	OEM CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
81	VCCCTS1HH101J		AA		C	Capacitor (50WV 100PF) [C45]
82	VCCCTS1HH101J		AA		C	Capacitor (50WV 100PF) [C46]
83	VCCCTS1HH101J		AA		C	Capacitor (50WV 100PF) [C47]
84	VCCCTS1HH101J		AA		C	Capacitor (50WV 100PF) [C48]
85	VCKYTP1HF104Z		AA		C	Capacitor (50WV 0.10 μ F) [C49]
86	VCKYTP1HF104Z		AA		C	Capacitor (50WV 0.10 μ F) [C50]
87	VCKYTP1HF104Z		AA		C	Capacitor (50WV 0.10 μ F) [C51]
88	VCCSPU1HL101J		AA		C	Capacitor (50WV 100pF) [C52]
89	QCNCW0341FCZZ		AG		C	Connector [CN51]
90	PGIDM1067FCZZ		AF		C	W card guide [CN52]
91	QCNCM0688FCZZ		AR		C	Connector (60pin) [CN52]
92	XNESD30-24000		AA		C	Nut (3NS) [CN52]
93	XBPSD30P16KS0		AA		C	Screw (3 $\times$ 16KS) [CN52]
94	QCNCM0688FCZZ		AR		C	Connector (60pin) [CN53]
95	XNESD30-24000		AA		C	Nut (3NS) [CN53]
96	XBPSD30P16KS0		AA		C	Screw (3 $\times$ 16KS) [CN53]
97	PGIDM1068FCZZ		AG		C	EXM guide [CN54]
98	QCNCM0342FCZZ		AW		C	Connector [CN54]
99	XBPSD20P16000		AA		C	Screw (2 $\times$ 16) [CN54]
100	XEPSD30P06000		AA		C	Screw (3 $\times$ 6) [CN54]
101	XNESD20-16000		AA		C	Nut (2mm) [CN54]
102	XWSSD20-05000		AA		C	Washer (M2) [CN54]
103	QCNCW1039ACZZ		AN		C	Connector (36pin) [CN55]
104	QCNCW0343FCZZ		AK		C	Connector [CN56]
105	VHDLRS73///-1		AA		B	Diode (RLS73) [D1]
106	VHDLRS73///-1		AA		B	Diode (RLS73) [D2]
107	RCILZ1003AC01		AA		C	Coil [FB1]
108	QCNCM0042FCZZ		AB		B	Connector (2pin) [J3]
109	VRS-TP2BD222J		AA		C	Resistor (1/8W 2.2K Ω $\pm$ 5%) [R1]
110	VRS-TP2BD101J		AA		C	Resistor (1/8W 100 Ω $\pm$ 5%) [R2]
111	VRS-TP2BD222J		AA		C	Resistor (1/8W 2.2K Ω $\pm$ 5%) [R3]
112	VRS-TP2BD101J		AA		C	Resistor (1/8W 100 Ω $\pm$ 5%) [R4]
113	VRS-TP2BD561J		AA		C	Resistor (1/8W 560 Ω $\pm$ 5%) [R5]
114	VRS-TP2BD561J		AA		C	Resistor (1/8W 560 Ω $\pm$ 5%) [R6]
115	VRS-TP2BD102J		AA		C	Resistor (1/8W 1.0K Ω $\pm$ 5%) [R7]
116	VRS-TP2BD103J		AA		C	Resistor (1/8W 10K Ω $\pm$ 5%) [R8]
117	VRS-TW2ED220J		AA		C	Resistor (1/4W 22 Ω $\pm$ 5%) [R9]
118	VRS-TP2BD103J		AA		C	Resistor (1/8W 10K Ω $\pm$ 5%) [R10]
119	VRS-TP2BD103J		AA		C	Resistor (1/8W 10K Ω $\pm$ 5%) [R11]
120	VRS-TP2BD561J		AA		C	Resistor (1/8W 560 Ω $\pm$ 5%) [R12]
121	VRS-TP2BD561J		AA		C	Resistor (1/8W 560 Ω $\pm$ 5%) [R13]
122	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R14]
123	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R15]
124	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R16]
125	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R17]
126	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R18]
127	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R19]
128	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R20]
129	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R21]
130	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R22]
131	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R23]
132	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R24]
133	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R25]
134	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R26]
135	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R27]
136	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R28]
137	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R29]
138	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R30]
139	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R31]
140	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R32]
141	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R33]
142	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R34]
143	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R35]
144	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R36]
145	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R37]
146	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R38]
147	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R39]
148	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R40]
149	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R41]
150	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R42]
151	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R43]
152	VRS-TP2BD220J		AA		C	Resistor (1/8W 22 Ω $\pm$ 5%) [R44]
153	VRS-TP2BD102J		AA		C	Resistor (1/8W 1.0K Ω $\pm$ 5%) [R45]
154	VRS-TP2BD561J		AA		C	Resistor (1/8W 560 Ω $\pm$ 5%) [R46]
155	VRS-TP2BD103J		AA		C	Resistor (1/8W 10K Ω $\pm$ 5%) [R47]
156	VRS-TP2BD103J		AA		C	Resistor (1/8W 10K Ω $\pm$ 5%) [R48]
157	VRS-TP2BD103J		AA		C	Resistor (1/8W 10K Ω $\pm$ 5%) [R49]
158	VRS-TP2BD103J		AA		C	Resistor (1/8W 10K Ω $\pm$ 5%) [R50]
159	VRS-TP2BD101J		AA		C	Resistor (1/8W 100 Ω $\pm$ 5%) [R51]
160	VRS-TP2BD103J		AA		C	Resistor (1/8W 10K Ω $\pm$ 5%) [R52]

NO.	PARTS CODE	OEM CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
161	VRS-TP2BD103J		A A		C	Resistor (1/8W 10KΩ ±5%) [R53]
162	VRS-TP2BD103J		A A		C	Resistor (1/8W 10KΩ ±5%) [R54]
163	VRS-TP2BD103J		A A		C	Resistor (1/8W 10KΩ ±5%) [R55]
164	VRS-TP2BD103J		A A		C	Resistor (1/8W 10KΩ ±5%) [R56]
165	VRS-TP2BD103J		A A		C	Resistor (1/8W 10KΩ ±5%) [R57]
166	VRS-TP2BD103J		A A		C	Resistor (1/8W 10KΩ ±5%) [R58]
167	VRS-TP2BD101J		A A		C	Resistor (1/8W 100Ω ±5%) [R59]
168	VRS-TP2BD332J		A A		C	Resistor (1/8W 3.3KΩ ±5%) [R60]
169	RMPTC8222QCKB		A D		B	Block resistor (2.2KΩ×8 1/8W ±10%) [RM1]
170	RMPTC8222QCKB		A D		B	Block resistor (2.2KΩ×8 1/8W ±10%) [RM2]
171	RMPTC8153QCKB		A D		B	Block resistor (15KΩ×8 1/8W ±10%) [RM3]
172	RMPTC8223QCKB		A D		B	Block resistor (22KΩ×8 1/8W ±10%) [RM4]
173	RMPTC8153QCKB		A D		B	Block resistor (15KΩ×8 1/8W ±10%) [RM5]
174	RMPTC8223QCKB		A D		B	Block resistor (22KΩ×8 1/8W ±10%) [RM6]
175	RMPTC8223QCKB		A D		B	Block resistor (22KΩ×8 1/8W ±10%) [RM7]
176	RMPTC8153QCKB		A D		B	Block resistor (15KΩ×8 1/8W ±10%) [RM8]
177	RMPTC8153QCKB		A D		B	Block resistor (15KΩ×8 1/8W ±10%) [RM9]
178	RMPTC8223QCKB		A D		B	Block resistor (22KΩ×8 1/8W ±10%) [RM10]
179	RMPTC8223QCKB		A D		B	Block resistor (22KΩ×8 1/8W ±10%) [RM11]
180	RMPTC8153QCKB		A D		B	Block resistor (15KΩ×8 1/8W ±10%) [RM12]
181	RMPTC8222QCKB		A D		B	Block resistor (2.2KΩ×8 1/8W ±10%) [RM13]
182	RMPTC8222QCKB		A D		B	Block resistor (2.2KΩ×8 1/8W ±10%) [RM14]
183	RMPTC8222QCKB		A D		B	Block resistor (2.2KΩ×8 1/8W ±10%) [RM15]
184	RMPTC8222QCKB		A D		B	Block resistor (2.2KΩ×8 1/8W ±10%) [RM16]
185	RMPTC8153QCKB		A D		B	Block resistor (15KΩ×8 1/8W ±10%) [RM17]
186	RMPTC8223QCKB		A D		B	Block resistor (22KΩ×8 1/8W ±10%) [RM18]
187	RMPTC8153QCKB		A D		B	Block resistor (15KΩ×8 1/8W ±10%) [RM19]
188	RMPTC8223QCKB		A D		B	Block resistor (22KΩ×8 1/8W ±10%) [RM20]
189	RMPTC8102QCKB		A D		B	Block resistor (1.0KΩ×8 1/8W ±10%) [RM21]
190	RMPTC8102QCKB		A D		B	Block resistor (1.0KΩ×8 1/8W ±10%) [RM22]
191	VSJC501-P// -1		A B		B	Transistor (JC501) [TR1]
192	VS2SA673A// -1		A D		B	Transistor (2SA673A) [TR2]
193	HPNLC0186FCZZ		A M		C	I/F panel
194	QEARP0038FCZZ (Unit)		A B		C	Earth plate B
901	CPWBN0735FC57		C L	N	E	ICU PWB

SHARP

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